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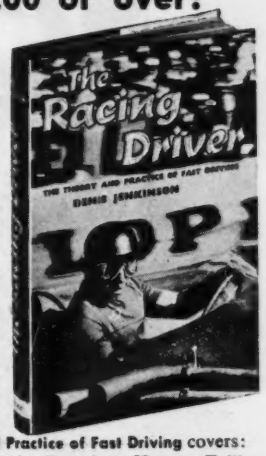

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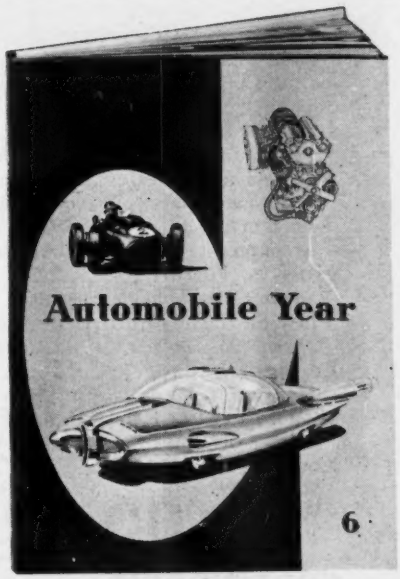

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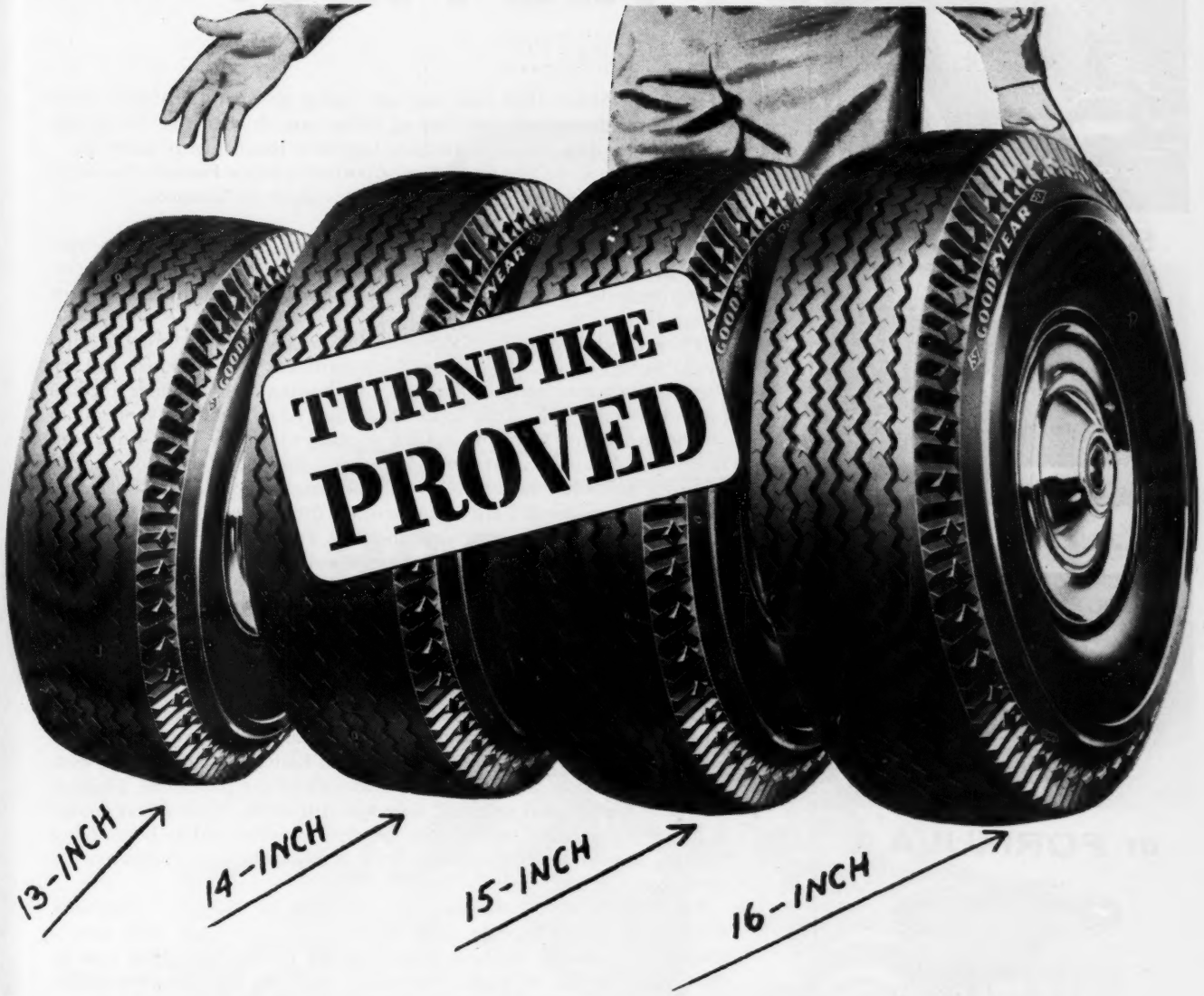

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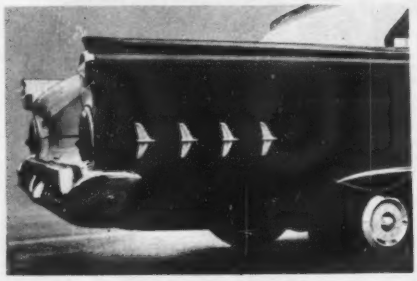

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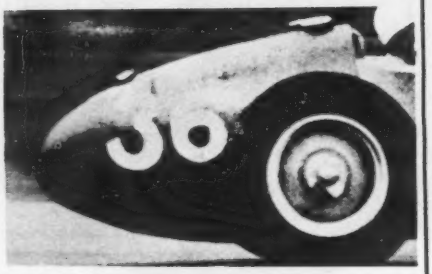

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IN THE MAY, 1959 issue we ran a story by Karl Ludvigsen about the new Formula Junior class of racing cars. At that time few people other than enthusiastic Italians had seen these mighty mites go.

Just a little while ago we had an opportunity to see Formula Junior in action in the first international event for them at Monaco.

Gentlemen, this is real racing!

At Monaco, these economy race cars turned in lap times that were only 10 short seconds slower than these of the Formula One equipment. Admittedly the Monaco circuit is a slow one for big machinery but slow is slow in any car.

These cars are true Grand Prix machines scaled down and using readily available economy car parts. Further the rules are strict enough to keep the cost down but loose enough, too, to allow ingenuity enough freedom for individuality. Prices for factory-built cars run around $3,000 ready to go with full-house Fiat-1100 engine. Sticking within the rules a man can build one for $500 to $1,000 under that figure if he uses good sense. Compare this with the figure for a front-running Formula III machine, heretofore considered THE equipment for the "impecunious enthusiast" and it can be readily seen that the new Formula is more like it. It strikes us that, given half a chance, Formula Junior could take the U.S. by storm.

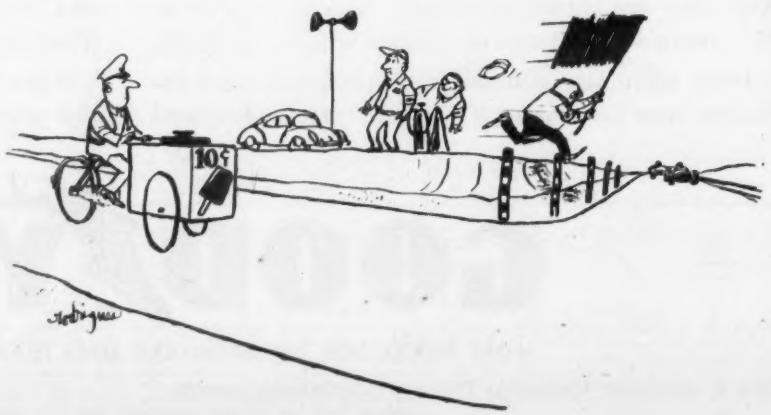
Next month we'll run a pictorial report on the doings at Monaco with a special feature on the Juniors. If you feel like real racing at production-car-or-less cost, watch for this.

* * *

While heading for Monaco, we had a chance to sample European type touring in the true European manner, i.e., flat-out cruising. Except for the towns and cities there are no speed limits other than one's own good sense and the ability of the car to stick to the pavement. There is plenty of traffic – not jammed, true but still traffic. Each driver moves at his own pace, slow or fast with the slow motorist seldom begrudging the fast one his speed. Compared to U.S. roads the main highways are mere county routes.

Yet despite the fast driving among the slow we didn't see a highway accident in nearly 10 days. The only bits of bent metal seen were a couple of *incidenti* of the bumper-hooking or fender-dinking type in the cities. The trip we took covered four countries and one principality in none of which were there any highway speed limits. They have accidents, true, but nothing like the incessant bashing of tin that we, with our limit-ridden highways experience. Here, where 55 is considered high speed touring and 35 is normal we mangle iron like berserk Vulcans. In Europe where anything under 100 kilometers per hour – 63 mph – is considered slow and the roads narrow and tree lined the accident rate is minimal. There seems to be food for thought here.

– john christy



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letters

STEAM . . . AGAIN

How can you print such a letter as that appearing on P. 9 of May, '59 SCI (More on Steam)? The misconceptions apparent in the mind of the writer only serve to further the popular misconceptions concerning horsepower, torque, and acceleration.

He states that "a 1956 Cadillac turning at 2500 r.p.m. develops 112 H.P. at the rear wheels", a completely irrelevant fact in his discussion, and altogether meaningless and misleading unless the effective road speed (or gear ratio) is given along with it, since drive train horsepower losses vary with what gear you're in, and how much the fluid clutch is slipping.

But the real stopper is his statement that "A 1920 Stanley Steam Car . . . would develop that much horsepower when leaving the curb to say nothing of having to go sixty miles an hour." In the first place, since the Stanley has direct gear drive from engine to wheels, when you are stopped at the curb the engine is stopped. Since horsepower is officially defined as:

H.P. equals Torque x rpm x .00019, and since rpm is zero at the curb, so is the horsepower equal to zero.

As to going 60 mph, I'd bet a 36 HP VW engine would run it 60 mph, since, at constant speed, only enough horsepower is required to neutralize the rolling friction and wind drag forces, which are not impossibly large.

Another interesting formula is the following:

Road HP equals $m \times v \times a \times 1/33{,}000$ where m is mass in pounds, v is speed in feet per second, and a is acceleration in g's.

So when the speed of any vehicle is zero, no matter what the acceleration is at that instant of time, the effective Road Horsepower is *zero*. Of course, as soon as the car gains speed, the road horsepower follows the above equation. But at zero speed, there is zero road horsepower, in any car, whether gas, steam, donkey, or jet power is used.

Another interesting result of this formula is the following: To maintain a constant acceleration in a car, the road horsepower must rise directly with the speed. An acceleration of 1 g in a certain car at 10 mph might require 100 HP, but at 60 mph, to get this same acceleration would require 600 HP! Since the Stanley was famous for its constant acceleration it may well be that it develops great horsepower at high road speeds, but only at high speeds. The Cadillac, however, since it has a hydramatic, can gear itself for near-maximum horsepower at any speed, and hence should be able to out-drag the steamer, even if they both had equal maximum horsepower and equal weights.

I hope that I have demonstrated some of the misconceptions present in Mr. Johnson's letter, at the cost of dragging in a few formulae. When you print such letters, I wish you'd explain where he goofed, and avoid pointless confusion about the basically simple concepts of force, acceleration, speed, and horsepower.

Charles Forge
Cupertino, Calif.

GOOD IDEA

Hasn't every rallyist gotten tired of tryingto explain to his friends the intricacies of a rally, probably concluding his lecture by saying "so you see, a rally is in no way a race, but a precise sport which requires a great deal of mathematical skill." For all his efforts, the friend will greet him a few days later with an enthusiastic "Well, have you been to any more of your little races, lately?"

All sports car enthuiasts are faced with this situation, since a large portion of the general public seems to regard sports car drivers as a reckless, irresponsible group of people who participate in activities which are not in accord with public interest. Any steps we take to gain favorable public opinion for our sport will benefit us in a number of ways, such as helping our clubs gain access to public roads for hill climbs, gaining the support of the public and the police with regard to rallies, and helping to defeat the frequently considered legislation which would prohibit all timed sports car events.

Our club has helped launch boy's auto clubs into safe, sane activities, and has designed rally rules which make it unnecessary for rallyists to travel at excessive speeds or to prowl about disturbing residents in the vicinity of the rally. These activities may have helped gain good public opinion of our sport. What are other clubs doing about this delicate problem?

Joan E. Sibol
Newark, Delaware

HELP!

I've been bitten by the "racing bug" and am contemplating building a Class H sports car using all Crosley components. All information about the class; cars in it; people; companies which have built them; car kits; places; accessories; etc.; will be greatly appreciated.

I would like to have a copy of the 1959 FIA rules and regulations; a list of all the sports car racing organizations and their functions—of the United States; a schedule of all the important races—formula and sports car; the whereabouts of a book or books on the history and development of sports and/or formula car racing and information on the Sports Car Club of America.

I know I've asked a lot but do hope that you can help me out; haven't been able to get much information on my own.

Ronnie Maye
9135 Sligo Creek Pkwy.
Silver Springs, Maryland

Can anyone help this poor fellow?

EXCHANGE INFO

I herewith have the pleasure of informing you that I am very much interested in everything connected with automobiles. As secretary of the Dutch Youth Car Club, called JAC (Jeugd Automobiel Club) it is my duty to keep my members regularly well informed about the latest activities in the motor branch. It is therefore I take this opportunity to ask you kindly to furnish me with details of the latest developments on motorcars. Is it perhaps possible to send me some of your auto magazines or technical descriptions which I can copy and distribute among the members of my club. Possibly you are willing to send me some of your magazines, which will be very much appreciated by all our members. Thanking you in anticipation we remain,

Jeugd Automobiel Club
's-Gravenhage
Postbus 525
Holland

We print this letter hoping that some of our clubs would like to gain a few friends in Holland.

ANTI CHEV

I just received the March issue of your magazine. For the past year and one-half your magazine has been getting worse with every issue. However, this issue is the biggest step in this same direction that you have ever taken.

In this issue no less than 41 pages have nothing on them but something about the Chev V-8. Only 19 have something pertaining to the sport. When you raise the price to 50¢ in the near future I suggest you publish two magazines instead. One called Chevie Cars Illustrated selling for 35¢, and the other called SPORTS Cars Illustrated selling for the remaining 15¢.

A Ferrari-Chev? Someone ought to shoot the bum

Joseph Weaver
Columbus, Ohio

What sport do you mean? The sport of automobile racing using the most suitable equipment available, or the sport of knocking anything and everything that does not come from across the ocean? A quick glance at the records will show that the Corvette engine is perhaps the most successful sports-racing engine going on American road circuits . . . would you feel better if the words "CHEVERELLI CORVETTINO" were stenciled on the valve covers?

ASTON MARTIN ANNOUNCE WITH PRIDE THE INTRODUCTION OF THE DB 4 / BRED FROM THE CARS THAT HAVE WON THE "1000 KILOMETERS OF NURBURGRING" TWO YEARS BACK TO BACK / CAPABLE OF ACCELERATION FROM 0-100 MPH AND FULL STOP IN 26 SECONDS — ROAD SPEEDS IN EXCESS OF 145 MPH AND PROVIDING SILENT LUXURIOUS ACCOMMODATION FOR FOUR ADULTS / MASTER OF ALL IT SURVEYS — INTENDED FOR THE CONNOISSEUR WHO WILL BE SATISFIED WITH NOTHING BUT THE ULTIMATE.

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☐ Full payment enclosed (Sportsmaster will pay postage)

☐ 25% on order — balance C.O.D.

technotes

COMPRESSION RAISING

I have a new Simca with the Flash (48 bhp) engine. Its compression ratio is 6.8/1. How much should I mill off the head to raise this to the 7.8/1 of the 57 h Flash Special?

Weldon L. Wilkerson
Temple, Texas

This is a very typical question of the many we receive. Instead of just giving the answer, I'd like to show how it's figured out. The compression ratio is equal to the volume in the cylinder contained between the valves and the piston when the piston is at the bottom of its stroke divided by the volume when it's at the top.

For our purposes, a better way to look at this is to refer to the Displacement Ratio. It is the ratio of the swept volume of a cylinder to its combustion chamber volume. It is always 1.0 less than the Compression ratio.

For a first approximation, the Displacement Ratio is also equal to the stroke divided by the effective height of the combustion chamber. Since combustion chambers are usually irregular in shape, this is only an approximation, but it's good enough for head milling purposes.

So if the CR is 6.8 and you want to raise it to 7.8, then you must change the DR from 5.8 to 6.8. A few quick steps which are easy to perform but awkward to set in type tell us that the amount to be milled off the head is equal to the difference in the two DR's divided by their product and multiplied by the stroke.

$$h = \frac{DR_2 - DR_1}{DR_2 \cdot DR_1} \cdot S$$

In the case of the Simca with its 75 mm stroke, h works out to be 1.9 mm or .075 inch.

Warning. Pushrod engines should either have the rocker shaft supports lifted an equal amount with spacers or else the pushrods should be shortened. If you have an engine with one or two overhead cams you should change CR by altering the pistons as milling the head will upset the camshaft drive geometry and/or timing.

STREAKY PAINT

I keep my car like new winter and summer, this is where my problem lies. I have a 1959 Austin Healey 100-6. It is red with a black top. Every time it rains or water gets a chance to lay on it for any length of time, dark spots and long black streaks appear on the surface of the paint. These streaks look similar to the way water looks running down a window pane. I'm almost positive that sap or birds are not responsible for it. I've tried all kinds of wax and cleaners, but nothing seems to work. Maybe it's the paint, or from something that was put on it to protect it when it came from overseas, I hope you can help me out.

Unsigned
Washington, D. C.

P.S. I forgot to add that if you wash with soap and water the streaks remain, but if you clean it with wax or cleaner the spots will come off until the next rain or snow.

Sounds as if you've been polishing a lacquer finish with silicon-bearing polishes. Your next step is to throw away all your old cans of polish. Then use a non-silicon cleaner and follow this up with a non-silicon wax. Presumably silicons give no trouble on enamel finishes but on lacquer this isn't so.

WEBERS

We wish to thank you—albeit belatedly—for your kind mention of us in your February issue as a supplier of Weber carburetors and parts.

Many people were pleasantly surprised to find that the racing Weber DCO carburetors were available for substantially less than current American prices, and that jets were cheaply and immediately available through us.

We recently ran across a letter in your Technotes column offering a "slight correction" on carburetor prices. Allow us to correct this correction a bit:

Weber 32 to 40 DCO (as fitted to Alfa) carburetors cost $125.00 each, and $245.00 for a pair (and not $170.00 each). Weber 42 to 50 DCO (as fitted to Jaguar) cost $150.00 apiece, (not $196.25). These prices are FOB Rome. The addition of a couple of dollars for shipping and 9% duty still keeps the prices of carburetors obtained from us well below the prices quoted in the "Technotes" column; at least a $30.00 saving per carburetor is realized! We can also guarantee a sizeable saving on prices for all other Weber carburetors.

A word about manifolds: unfortunately, we can only supply them for certain current production Italian cars. Example: a manifold for two 32 DCO carburetors for the Fiat 1100/103, or 1200; these engines are widely used here for the increasingly-popular Formula Junior.

Of course, we continue to supply all speed equipment for Fiats, Alfa, and the eternal Crosley.

C. Richard Hatch
RAM (Rome-American-Motors)
Via Dei Leutari, 29
Rome, Italy

"Tutto per I Bolidi—Everything for the Race Car".

OOPS DEPT

A phone call from Detroit brings the interesting news that the Chevrolet Bel Air described on page 44 did not have a Positraction differential after all. It isn't available with the 3.55 rear end. How then to explain the evenly matched black streaks shown in the photos? Perhaps a reader can supply an answer.

The final drive ratio has just been changed to 3.70 on the test car. With this comes the news that this ratio may now be ordered as original equipment.

Crossed up symbols: the flags on the hood denote the 348 cubic inch engine underneath. It is neither exclusive to nor standard on the Impala.

TWIN CAM TIMING

Time called the pace on last month's MG Twin Cam tuning report before we could get the full data down on timing. At that time we indicated cam timing should be done by the workshop manual. If done by the outline therein the car will run but it won't be a race winner. The MG Car Company technical boffins found this out after the original books had gone to press and are now at work on a new section to cover this and other items that could only come out in development.

In the meantime the following outline may help.

First and foremost, a degree wheel and a dial gauge are mandatory. Set the degree wheel on the crank-nose and zero it in on top dead center on number one cylinder with the dial indicator.

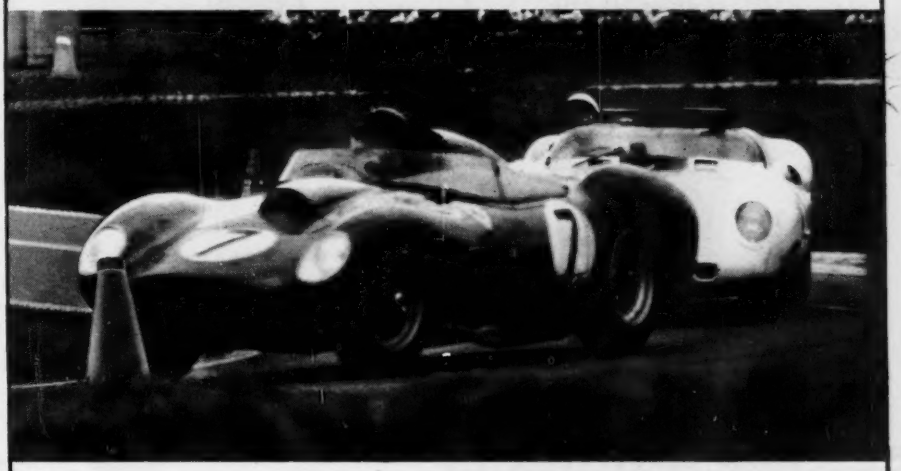
Set the cams in place and lock the cam sprockets in their recesses away from the cams. Set the intake cam at the point where the dial indicator shows it is just starting to open the valve, i.e. at the base of the opening ramp (which, incidentally, will be the lowest point on the lobe as well). Rotate the crank to the point on the degree wheel where the intake cam is to open. Now, loop the chain over the half-speed sprocket, making sure it is snug and properly engaged. Draw the chain up over its rubbing block and pull it taut by hand. Loop it over the intake sprocket and carefully slide the sprocket onto the cam, watching the dial indicator. If it moves you've guessed wrong — it must remain still. Try again with a different set of sprocket holes until you have exactly the right ones. Be patient, it may take time.

When the intake is spot on, cinch on the sprocket and pull the chain taut by hand over to the exhaust cam. Carefully, now, move the crank until the degree wheel indicates the opening point of the exhaust for number one hole. Under no circumstances allow the chain to slip at this point. Reset the dial indicator on the exhaust side on number one lifter and go through the same process of trying sprocket holes, again watching the dial indicator for unwanted movement. Admittedly this is a cut-and-try proposition but the results are worth it. Only after the exhaust cam is right on the mark can the chain be run taut with the chain tensioner. If this painstaking method is not followed on first asembly any number from two to six degrees can be lost in the timing and you'll never know where. It occurs at the end when a loosely fitted chain and "look-right" sprocket fitting combine to pull the cams toward the exhaust side on tightening of the tensioner. Another place where timing can be lost is in poor valve lash settings. There can be no tolerance here. The book says from 16 to 18 thousandths but they don't mean from valve to valve. If you pick .017 of an inch stick with it throughout, even if you have to touch up some of the stems slightly with a stone. To make things easier at a later date, you may now mark the chain and sprockets with a bit of paint. These marks will then be valid until chain stretch puts things out which will be some time in the future.

However, remember that care pays off. Though the above wwill take time and try the patience of a Job, the result will be worth it in smooth torque and a power output that the man at the drawing board intended.

Sebring

tough on tires...won on DUNLOP



The Hill-Gendebien Ferrari winning Sebring on Dunlop

Sebring 1959. Twelve gruelling hours of speed, tension, rain and then darkness. A thousand miles of treacherous curves and roaring straights — always with the threatenings of rival cars, each straining to take and keep the lead.

All this is history today. The world knows who raced, who won. But did you know that the winners raced on Dunlops? And the second-place team, too? As well as five of the nine individual class winners? Plus twenty *other* Sebring racers?

That's a total of 26 Dunlop-shod cars on the track at Sebring in '59 — more than twice as many Sebring cars as drove on any other make of tire!

To come down to cases: Phil Hill and Olivier Gendebien had Dunlops on both the Ferraris they used to win. Jean Behra and Cliff Allison, in another Ferrari, were hot on their tail — just a lap behind at the end — on another set of Dunlops. And the winners of Classes D (Hill-Gendebien), G, 9, 7 and 4 were Dunlop-equipped.

What do facts like these indicate about a tire? The answer lies in what Sebring does to a tire.

Sebring is probably the most gruelling sports car race in the world — and it treats a tire accordingly. Sebring punishes a tire with a cruel mixture of road heat, high speed heat, grating concrete, and the unimaginable stresses inflicted by swift, severe cornering and powerful brakes. (And both the winner and the second-place Ferrari were equipped with Dunlop disc brakes, too.)

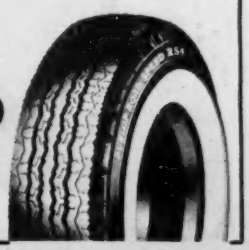
Sebring demands a superb tire. What the performances and the choices at Sebring indicate is that top sports racers and top sports car engineers feel that Dunlop builds just this sort of tire.

The tire truths we learn from building tires that win at places like Sebring are used to your benefit when we build Roadspeeds or, for that matter, any Dunlop tire. Our tire advice, in a capsule, is this: Every Dunlop tire is designed to do a specific job and built to do that job superlatively. You're ahead if you use the Dunlop tire built for you.

There's a world of confidence in

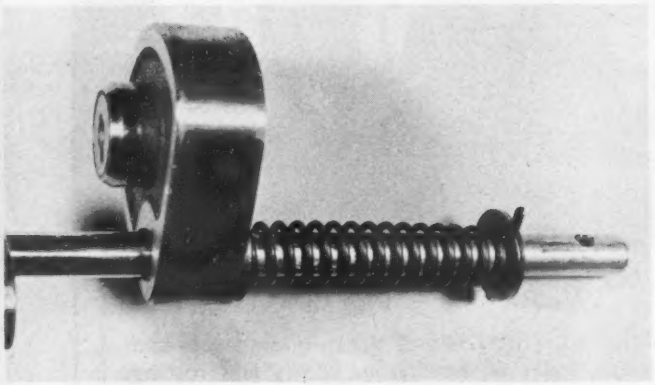
DUNLOP

TIRE AND RUBBER CORPORATION, BUFFALO 5, N.Y.



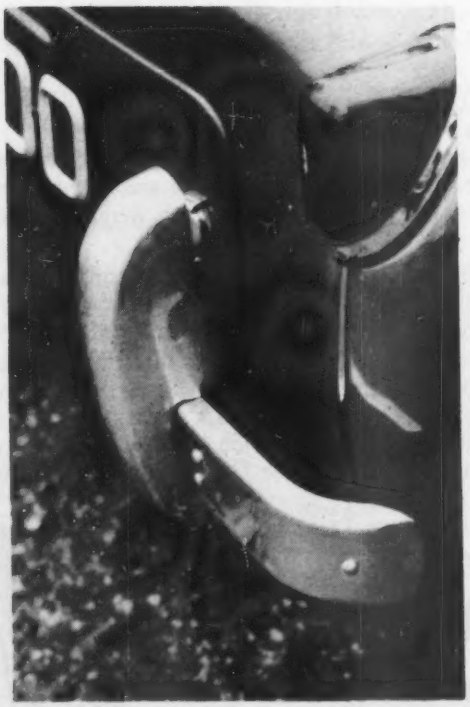
new products

Left: To help round out your Go-Kart stable there is now a two-wheeled version available. Powered by a 4 hp two-stroke, the Big Bear Scrambler weighs only 47 lbs. and is about the size of a suitcase . . . easily carried in the trunk or on the luggage rack of a sports car. Top speed is in the vicinity of 30 mph. For those who prefer a more docile cycle, the Greenhorn Enduro is powered by a 2½ hp engine, with a top speed of 25 mph. Prices are $149.50 and $100.00 respectively. For information write to Go Kart Mfg. Co., 6300 N. Irwindale Avenue, Azusa, Cal.



Left: With the MGA becoming more and more popular, the location of the trunk release knob is no longer a secret. Any valuables you have hidden away in the trunk, which is the only storage space for them, may be stolen fairly easily. R & S Products, 51 Forestdale Avenue, Dayton 32, Ohio, sells a trunk lock which is easily installed in the hole left by the original wire pull and grommet. The screws are installed from the trunk side, rendering the unit completely tamper proof. Price is $8.95 post paid.

Right: A no-rub technique in car polishing comes from Car-Skin Products Corp., Flemington, New Jersey. In order to obtain brilliance in a car's finish all old wax and oxidized paint must first be removed. Car Skin Reconditioner is a wipe on-wipe off cleaner that removes all foreign matter, leaving the original paint perfectly clean. The wax is then applied to the entire car and can be wiped off any time with no rubbing necessary. The reconditioner sells for $1.45 per pint, and the wax for $2.00 per 5 ounce can.



Left: Triumph rear fenders are particularly vulnerable to dents and scratches. To eliminate this, Montco Imports, 1144-A Fulton Street, Brooklyn, N. Y. offers these British made bumperettes. Constructed of chrome plated heavy gauge steel and braced across their full width, the units are easily attached to existing bolts. Price is $17.95 per set.

Below: Foreign club badges in baked enamel are available from Foreign Emblems Inc., 8318½ West Third Street, Los Angeles, California. The badges represent eleven countries and are drilled for easy mounting. Priced at $2.95 each, postage paid.

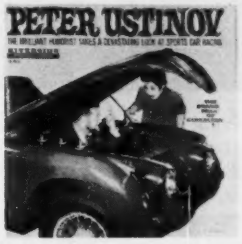
FIVE EXTRAORDINARY LP RECORDINGS

RLP 5013 $5.95

Another first for our roving recording crew. England is the home of some of the world's most famous vintage racing machines. Hear for the first time such legendary engines as the E.R.A., Delage, V 16 Maserati, 51 Bugatti, P3 Alfa Romeo, Alta, Frazer-Nash Boulougne etc., recorded revving and at speed with on the spot descriptions by world renowned racing authority David Scott-Moncrieff. Available in both monaural and stereo versions.

RLP 1115 (stereo) $5.95

Peter Ustinov, a sports and racing car devotee of long standing has taken a close look at our popular Sports Car Series and has come up with a devastating parody of his own. Creating all sounds and voices himself, Ustinov satirizes all that we hold dear and familiar in the world of racing. Hear the exciting sounds of the Fanfani, Schnorcedes, America's own Wildfowl, the Orgini etc. Thrill to the Le Mans start, interviews with Bill Dill, Girling Foss, World Champion Fandango and other drivers you know so well. Wives, sweethearts and friends who have never understood our records will love this one.



RLP 12-883 $4.98

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THE INCREDIBLE SOUNDS OF THE TWO GREATEST GRAND PRIX CARS EVER BUILT
MERCEDES-BENZ
THE W125 AND W163 DRIVEN IN SPECIAL DEMONSTRATION AT OULTON PARK, ENGLAND

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A FANTASTIC NEW RELEASE: We went to England via BOAC just to bring you the sounds of the two greatest racing cars ever built. Brought out of the museum for this special exhibition and driven by Peter Collins and Tony Brooks, the W 125 and W 163 Mercedes are the only cars which have ever actually made our eardrums ache from the sounds of their engines. Idling, at speed, shifting, starting, stopping etc. the sounds on this disc are the absolute ultimate in racing car recording.

Sports Cars in Stereo is another example of Riverside's outstanding leadership in the field of recording. If you have a stereo system or if you anticipate going into stereo this record is a must! Imagine being on the Esses, on the straights, at technical inspection at Sebring as Ferraris, Astons, Jaguars, Oscas, etc. roar through your living room from left to right.
It's difficult to describe the sensation of hearing a supertuned competition machine hurtling towards you from your left, shift gears with neck-snapping precision not two feet from where you stand and then scream off into the distance on your right. This is not just an audio thrill, it is a physical experience.

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And don't forget our other outstanding releases:

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Send the records postpaid. I enclose $_____. No C.O.D.

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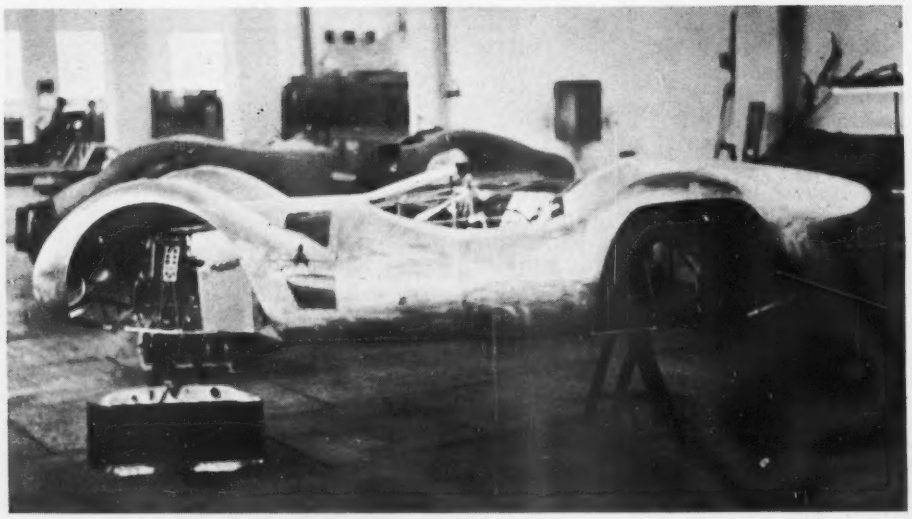
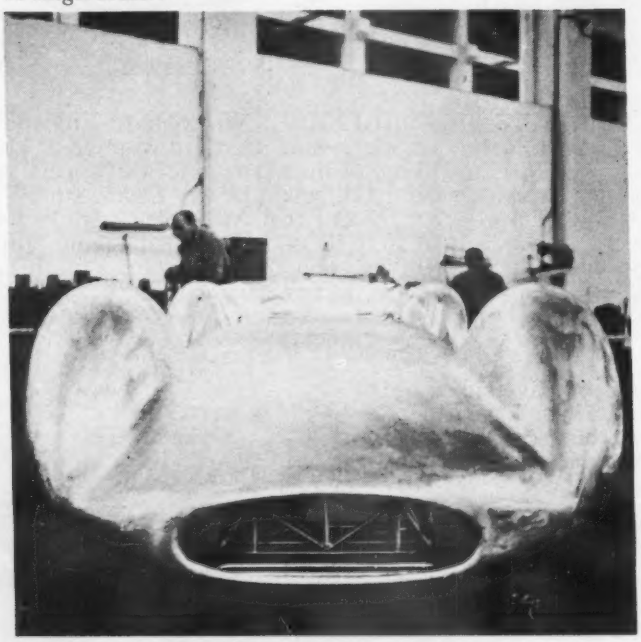
newsletter from Europe



New Maserati sports car reaches toward the ultimate in lowness and lightness. Basic 2-liter engine will also be used in single seater.



The first new 6-cylinder Fiat in many years the 1800 sedan displays modern Italian angular good looks.

Lord Montagu, a staunch vintage car enthusiast, leaves the church with his bride Miss Belinda Crossley. Their carriage? A 1906 Renault, naturally.

Aside from the introduction of the FIAT 1800, there was very little new and interesting at the 1959 Geneva "Salon". The 1800 six-cylinder is a valuable addition to the Fiat line for its price is extremely competitive in world markets. The two versions, the 2100 and the 1800 are available either as sedan or station wagon and though far from being new and radical in design are apparently from first reports quite good cars: SCI will obtain an 1800 in the near future for a full test. The 1200 Spyder has been restyled slightly so that it will harmonize and complement their new 1500 GT coupe which is scheduled to go into production early this summer. The 1½-liter coupe is now in finalized form and the Osca-designed dohc four-cylinder engine will be built by Fiat.

The word from Citroen is that their ID19 station wagon which stole the Paris show last year will not begin to come off the lines until fall of this year.

Disc brakes are really taking hold in Italy. Lancia has now adopted them for use on the Flaminia series *"Freni a dischi"* are available on request on the Flaminia sedan while it's most probable that the sports and GT Flaminias will have disc brakes as standard equipment.

From England comes word that there's talk of a merger between Standards and Rovers. Rovers are giving considerable thought to the fitting of disc brakes to their new 3 liter.

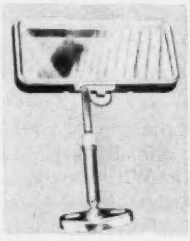
(Continued on page 16)

ANOTHER MIDSUMMER CLEARANCE AT MG MITTEN!

use this page as order blank to save $

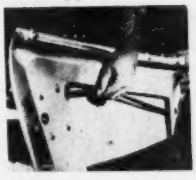
Hi, there! As you can see, the familiar photo of yours truly, Marion, has been omitted in favor of a selection of new items. If there are vociferous complaints from my fan club, we will rush back into print with the likeness. (**Please** write, fans) These new gizmos, plus an old favorite occupy the column directly beneath this traditional introductory jazz. The mirrors, we commend to every car owner as being real bargains: High quality at a sensible price. On the rest of the page sharp eyed readers will discover a multitude of good things at big savings made possible only when you shop by mail. We stand behind every item with a money-back-if-not-satisfied guarantee. So, you're plenty safe.

☐ **WINGARD FENDER MIRROR**
This heavily chromed modern mirror is one of those mechanical marvels that returns to original position no matter how often or how hard it is bumped. Set it and forget it, say the manufacturers, one of England's oldest accessory firms. Excellent optically. Select from ☐ flat or ☐ convex. Price: **$4.25**



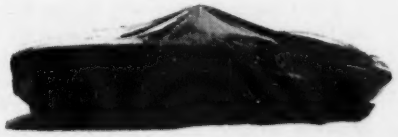
☐ **ANTI-DAZZLE MIRROR**
Simply flick the lever on this superb interior mirror and following headlights lose their glare. An adjustable, telescoping pillar lets you set it for height as well as tilt for your personal driving comfort. Heavy, quality in every line, replaces any interior cowl mirror. Price: **$5.95**

☐ **ADJUSTABLE PILLAR MIRROR** without anti-dazzle feature: **$2.95**



☐ **SPRITE DOOR PULL** can be operated by pulling up or pushing down. Replaces hard-to-reach door handle. Trimmed to match car interior, Specify color of upholstery here ..... Price: **$4.95** pr.

☐ **MINISHADE SUN GLASSES** weigh less than 2 oz. yet offer full protection. Ground lenses are supplemented by flip-up tinted plastic shades. Sturdy metal frames. Clip carrying case included **$3.95**



People who have never made a practice of keeping their cars covered with one of our famous tailored-to-fit Mittens just don't take advantage of the money-making possibilities inherent in them. By protecting the finish, chrome, interior leather, plastic or wood and fabric tops, the careful owner puts considerable extra loot in his pocket at trade in time. Unless you plan to have your transportation buried with you like Egyptian Kings, get a Mitten now.

	Lightweight Sun and Dust Cover	DURICON Water Repellent
☐ MG Mitten ☐ Healey Hugger ☐ Alfa Apron ☐ Fiat Frock (1100TV) ☐ Sprite Spat	$17.95	$24.50
☐ Morris Muff ☐ Renault Romper ☐ Ghia Gown ☐ Porsche Parka ☐ Peugeot Pegnoir ☐ Minx Muff ☐ Fiat Frock (600) ☐ Saab Sack	$22.95	$29.50
☐ Corvette Cap ☐ Thunderbird Tepee ☐ Jaguar Jacket (140, 150, 3.4) ☐ Mercedes Muff (190, 300 SL) ☐ Volvo Vest	$27.95	$32.50

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"IMPACT" BELT with U-bolt hardware. **$10.95** ea., **$21.00** pr.

☐ **A-E LUGGAGE RACK.**
Chrome frame, polished hardwood slats. Attaches firmly but is removable. Large rubber suction cups protect finish. Fits MGA, TR and Healey.....**$24.95**

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☐ JAGUAR 120-140-150	$31.95
☐ MERCEDES 190SL	$44.95
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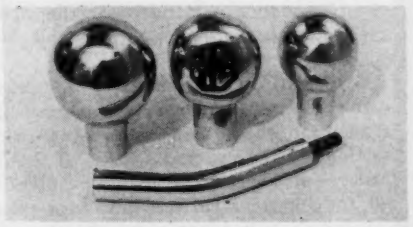

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Padded with soft leather, shatterproof lenses and wide-angle vision are outstanding features.....**$6.95**
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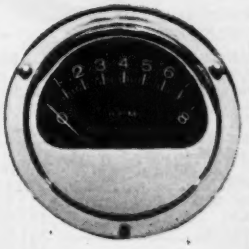

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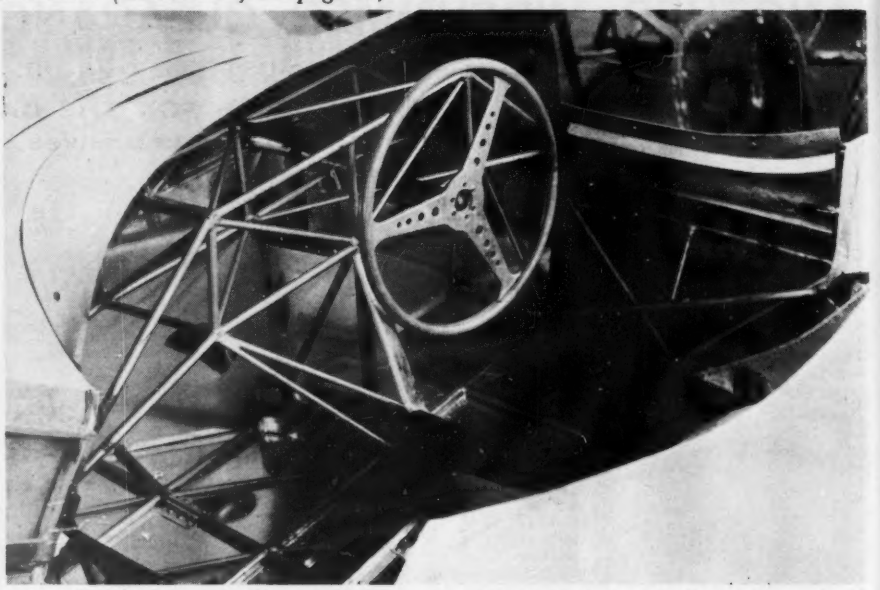


"Bird cage" space frame of Maserati 2-liter is built up of miles of tiny tubes. All you need is patience, and 12 men with welding torches.

The financial condition of Lancia in Italy and BMW in Germany continues to be very bad. There have been rumors about the possibility of a tie-up between Lancia and Volkswagen. VW would then have a vastly improved dealer network in Italy, enabling them to compete seriously in the European Common Market.

Countries participating in EUROCOM have agreed to lower their import tariffs 10% annually; this means a slow start but after ten years, for example, the price of a VW in France will be very near to that of a Dauphine. So the FIA isn't the only thing over here that moves slowly.

The Maserati firm (Modena) are breathing easier these days having been bought by the German firm of Rheinstahl AG, a subsidiary of Krupp. The 3.5 GT car is still being built of course and development work on the new 2-liter "bird cage" sports car continues with no definite date of completion yet set.

The car's nickname gives the clue as to the type of chassis used. It is a space frame with most of the space taken up by inch tubing formed into one of the most complex, and presumably light, arrangements seen to date. The car is a basic unit — according to Maserati — that can be easily turned into a 3-liter two seater or a single seater-seater Grand Prix machine. The 2-liter engine is reported to be developing 200 bhp. The power plant weighs in at 270 pounds — while a total dry weight of 1200 pounds is claimed for the whole car, complete with engine and new five-speed magnesium gearbox.

Alejandro de Tomaso's OSCA powered rear-engined 750 — which had been intended for Sebring but was not quite ready in time — will run at Le Mans. It should prove — if bug proof — a strong contender for the Index of Performance. Last year's convincing win in this category by the team of de Tomaso and Colin Davis with another OSCA, pretty well proved the durability of the power plant in their present mount. The new car, chassis-wise, is pretty much the brain child of de Tomaso. A tubular space-type frame is used, and the front suspension is by an upper wishbone with a transverse spring mounted below the lower frame tubes. The engine sits ahead of the rear wheel centers ala Porsche Spyder and drives through a Porsche transmission. With the exception of the front-mounted radiator — and its smaller size — the car is very RSKish in appearance.

The Team Lotus Formula 2 cars will have oil cooling tubes flush mounted outside the bodywork between the front and rear wheels. Two types of single-seater chassis will be on the circuits this season. Those used by the works team will have the driver situated about 1½-inches to the right of the centerline of the car. An elliptical sheet metal former — with big lightening holes — is used at the scuttle section. This frame, for obvious reasons, is called the hula hoop type. The rear wheels are now located by a single three-arm wishbone low down at each side, which makes for a much more rigid arrangement than last year's single radius arm.

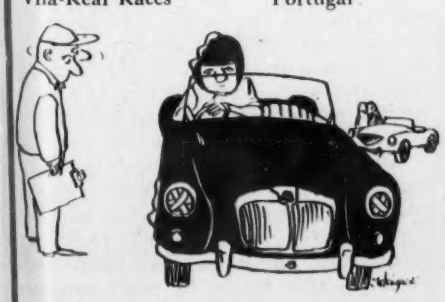
The Cooper factory will be represented on Grand Prix circuits this season by four cars. Two Formula 1 cars and two Formula 2 cars will be assigned to Australians Brabham and McLaren with American Mastern Gregory also a part of the factory team.

The cars are basically unchanged from last year's single seaters. Detail modifications include different engine mountings, a method of adjusting the rear suspension to alter camber angles and larger section tires. The Citroen-based transmission has been further beefed up to take the increased power of the latest 2,495 cc Climax engines. The marque will be further represented by private owners driving Coopers powered by B.R.M., Borgward and Maserati engines. All in all it should be difficult to cope with the Coopers this season.

The Borgward power plant signals a re-awakening of interest in racing by that firm. The German company has contracted to supply engines, parts and overhaul service to the British Racing Partnership for their Borgward equipped cars. Output figures of 160 hp have been quoted for these racing engines. (The Borgward engine will be the subject of an SCI technical report in the August issue.)

COMING EVENTS

DATE and EVENT	LOCATION
June 14 Grand Prix of Belgium	Belgium
June 14 Macon-Solutre Hillclimb	France
June 20-21 Elkhart Lake National Races Chicago Region SCCA	Elkhart Lake, Wis.
June 20-21 Historic N.Y. National Rally N.Y. Region SCCA	
June 20-21 Washington Region SCCA Race	Marlboro, Md.
June 21 Northwest Region SCCA Race	Shelton, Wash.
June 20-21 Hill'Climb	Mt. Equinox, Vt.
June 20-21 24 Hours of Le Mans	Le Mans, France
June 26-27 Glen Region SCCA Race	Watkins Glen, N.Y.
June 27 Northern N.J. Region Gymkhana	
June 28 Mont Ventoux Hillclimb	France
July 3-5 New England Region SCCA Race	Lime Rock, Conn.
July 4-5 Steel Cities Region SCCA Race	Connellsville, Pa.
July 3-5 Pikes Peak Hillclimb	Pikes Peak, Col.
July 5 Grand Prix of Europe	France
July 5 Grand Prix	Mallory Park, England
July 5 Mendola Hillclimb	Italy
July 11 New York Region SCCA Midsummer Rally	
July 11-12 Washington Region SCCA Race	Marlboro, Md.
July 11-12 Los Angeles Region SCCA Race	Pomona, Cal.
July 12 Trento-Bondone Hillclimb	Italy
July 12 Grand Prix de Rouen	France
July 12 Vila-Real Races	Portugal



summer racing season/preparation/ **NEW IMPORTS**

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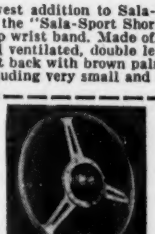
Newest addition to Sala-Sport's line of driving gloves are the "Sala-Sport Shorties". Features adjustable snap wrist band. Made of Skin-Soft Italian leather, well ventilated, double leather palms. Available in knit back with brown palm only. Sizes: 6½-10 including very small and very large.



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Racing Steering Wheel

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Duralumin one-piece frame with rim made in contrasting laminations of light African Obeechi wood and rich dark Mahogany. Hand French polished, finger serrations for a much more firm grip. This wheel is slightly smaller in diameter and allows an ease of handling not experienced with stock wheels. No driver who has tried one has ever failed to express his enthusiasm for the distinctive Derrington wheel. The purchase price includes all necessary fittings. Anyone may install it with tools in the standard kit.

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Embroidered in full colors. See example shown.

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3" Emblems for left breast pocket $1.00 ea. ppd.

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To be sewn on back of racing suit or jacket. See MG Emblem illustrated for relative size. Jaguar (blue, red, black on white); Morgan (red on white); Corvette (authentic colors); Mercedes (white on blue); MG (red, black, blue, on white); Porsche (red on white); Austin Healey (red on white); Fiat (blue on white); TR (blue on white); Alfa (authentic colors).

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All "AMCO" wind wings and sun visors have highly polished edges—Fittings are made of machined brass, Triple chrome plated.

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SUN VISORS MGA CPE - MG - TC - TD - TF - Triumph 2 & 3 - Austin-Healey; 100/6 Berkeley - Sprite **$6.95** Ea. ppd.

For Jaguar XK-120, 140, 150 - Austin Healey 100 **$7.95** Ea. ppd.

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Quick Filler Caps

$22.95 ea. postpaid

As the name implies these are authentic Monza type quick filler caps with large 3-1/2" throat diameter, 5" overall diameter. This is a basic necessity for drivers of competition and sporting cars. Light alloy construction. Complete with base. Rugged use invited, and of course, Monza feature of spring-loaded gas seal. 2¼", $16.95 ea. ppd.; 2½", $18.95 ea. ppd.

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The United States Auto Club has signed contracts with the Purdue University Research Foundation for a series of tests of automotive safety equipment. This program is a part of the continuing effort of USAC to improve safety conditions not only in racing but on the highway as well.

Thomas W. Binford, president of USAC said when making the announcement: "There are many factors which affect safety in auto racing. Safety equipment is an extremely important one. The United States Auto Club feels that all decisions concerning the approval of this equipment should be based on fact and consequently we are very pleased that Purdue is willing to undertake this study to ascertain the facts."

The initial project will be to gain more knowledge about crash helmets, both in design and materials used.

■

Merger of two national Mercedes-Benz owners clubs was approved April 21st at a meeting of the Board of Directors of the combined organizations.

The Mercedez-Benz Club with headquarters in Illinois voted last month to merge with the Mercedez-Benz Club of America organized in New Jersey to bring together more than 1,000 owners and enthusiasts represented in seven national Regions and nineteen Sections. Both MBC and MBCA were formed in 1956.

The newly constituted Board of Directors continues MBCA President Dr. K. A. Bartlett, Jr. of Cedar Grove, N.J. as head of the merged organization.

Mr. L. B. Kirkendall, Glen Ellyn, Illinois, former Midwestern Vice-President of MBCA was appointed to the new position of Executive Vice-President. Mr. Harry O. Owen, Jr., Maywood, Illinois, MBC national secretary succeeds Mr. Kirkendall as Midwestern Vice-President.

Other appointments to the Board: Selection of Roland P. Beattie II, of Madison, N. J. as Eastern Vice-President to replace Arthur Kortheuer, Hastings-on-Hudson, N. Y. Mr. Kortheuer was chosen a Director-At-Large and continues as Editor of the club's national magazine, THE MERCEDES-BENZ STAR.

Mr. Henry Austin Clark, Jr., Glen Cove, N. Y. was selected as a Director-At-Large:

Vice-Presidents of two new national Regions were also chosen: Mr. Arthur G. Rippey, Denver, Colorado, for Rocky Mountain, and Mr. Herbert Wandtke, Gresham, Oregon, Northwestern.

The following telegram was sent to Toptex by John Luce, president of the Snell Memorial Foundation.

"After the testing of large numbers of Toptex helmets by an independent investigator it has been established that the helmets which led to the Snell Memorial Foundation disapproval were a chance occurrence of several helmets of minimum manufacturing tolerances. The manufacturer has proven to the Foundation that no changes have occurred in their manufacturing processes. However the company has made minor changes in production methods to decrease their process tolerances and thus produce helmets of a more uniform quality.

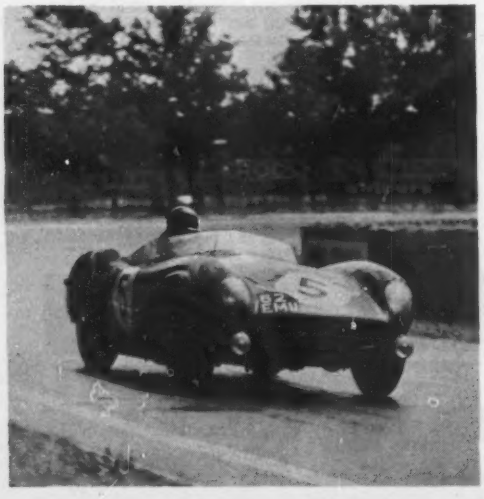
In order to prevent recurrences of this nature the Snell Foundation has established minimum standards which will be issued to manufacturers and appropriate consumer groups. These standards are to be revised yearly and will provide the basis for Snell Memorial Foundation certification. The Snell Memorial Foundation wishes to assure the users of Toptex helmets that even at the extremes of the previous manufacturing tolerances the Toptex competition helmet represents a high order of protection and overall acceptability. The Snell Memorial Foundation herewith reinstates approval of the Toptex competition helmet."

DB3S/6, alias 62EMU.

By Martin Denis

A WIN in a world sports car championship race is worth eight points and a second rates six, by which scale of values 62EMU's aggregate Le Mans score to date works out at the equivalent of 1½ outright victories. In 1955, as a works entry with Collins and Frere co-driving, this characterful Aston Martin placed second on general classification, won the 3-litre class at a record average of 105.45 mph, was third on Index. And last year, privately entered for Le Mans by Peter Whitehead, who'd bought it early in '57, it duplicated its second placement of 1955, shared by the brothers Whitehead, Peter and Graham.

David Brown's dearest ambition, he says, is to win at Le Mans this year, but if the coveted endurance prix should continue to elude him he can perhaps console himself in contemplation of 62EMU's past glories.



DB3S/6, to resort to the Feltham factory's designation (62EMU is its license plate label) is a widely traveled car with a star-crossed career behind it. Built in 1954, it made its Sarthe debut in inauspicious circumstances, in care of Prince Bira and Peter Collins. Bira had been quoted shortly before the race as saying "I'm not giving up racing—it's giving *me* up". And the Aston lent point to the remark by going off the road and looping three loops at White House, catapulting the little Thailander out in a most unprincely Dax-over-dandruff trajectory.

At Silverstone the following month, in the British GP meeting, Collins and 62EMU won the over 1500 cc division of the sports car race at 86.43 mph, and Reg Parnell, with the benefit of newly added disc brakes, raised this to 93.58 in winning again at Silverstone with the same equipment in May of '55. This favorable augury, as we saw a few paragraphs back, was fulfilled a few weeks later by the Collins-Frere success at Le Mans.

Peter Collins had a strong sentimental attachment to old 62EMU, which enlivened his 1955 sports car program by placing him second to team-mate Salvadori in the Aintree international (plus fastest lap for Pete), finishing third in the Goodwood Nine Hours, and blowing up in the TT, but only after going around Dundrod within one second of the best lap by co-winner Moss on the 300 SLR Merc.

Growing middle aged gracefully under David Brown auspices, the car at Sebring in '56, co-driven by Moss and Collins, and was in second place when it seized solid beyond half distance and took the count. At the end of this, its least successful season, the Aston was sold to the late Peter Whitehead and embarked on a frontier-hopping round of engagements in 1957 that took in British, German, French, Swedish, Finnish, Danish and Belgian races. Successes included a win in Finland's tongue twisting Elaintarhanajo-Djurgardsloppet.

Aston Martin estimate that up to the time of the Whitehead deal, 62EMU had covered nearly 9,500 competition miles, not counting practice sessions.

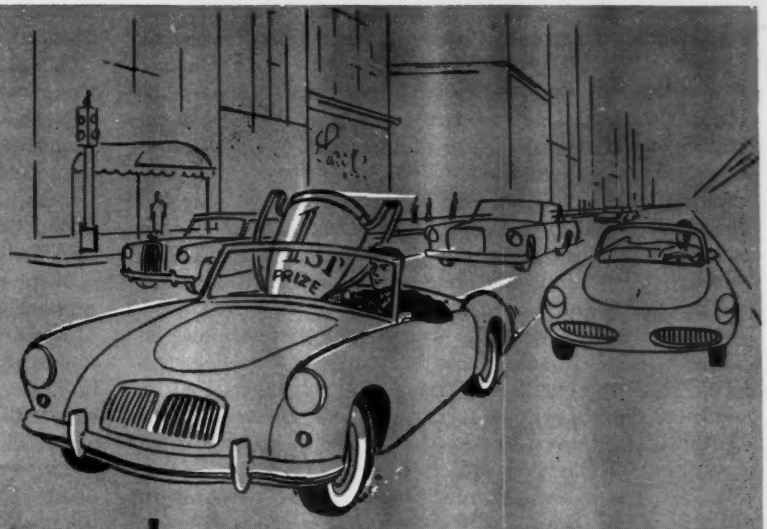
On a slightly anticlimatic note, it has to be admitted that not very much of the original Aston now lurks behind that familiar and beglamored license number: in the winter of 1956-7, just before Whitehead bought it, it was involved in a bad crash at Silverstone during tryouts of beardless candidates for places on Mr. Brown's team. It took such a beating that both the body and chassis had to be replaced.

Throughout its packed 1957 schedule, 62EMU failed to finish only one race, and that was due to a very minor disorder. In preparation for 1958 Peter Whitehead had the factory give the engine a thorough rejuvenation, including fitting a new crankshaft, rods and pistons and overboring the cylinders to 84 millimeters; whereupon, as though in protest at this intrusion on its well settled vitals, this long suffering servant of many masters promptly broke its new crank and stuffed a few rods through the side.

After Peter Whitehead's tragic death in last year's Tour de France, 62EMU passed into the possession of a little known English driver, one M. Bond. If Bond should turn up at Le Mans with his celebrated relic, maybe he won't remain little known.

—md

THE WINNER!



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by George Hill

NEW RULES FOR BONNEVILLE

►The fastest cars in the United States are now being prepared for what may result in the greatest collective assault in history on International Records. During the latter part of the month of August, this year, more than 200 cars and their crews of amateur speed enthusiasts will gather on the Salt Flats in Western Utah for the Eleventh Annual Bonneville National Speed Trials.

Some of the records that will be up for grabs this year are: John Cobb's World's Record of 394.2 mph; Rudy Caracciola's Class B record of 268.9 mph; Malcolm Hooper's Class C mark of 235.9 mph; and numerous attempts will be made on Classes E, H and I records.

Mickey Thompson, in a four-Pontiac-engine powered machine will be in serious contention for the twelve-year-old record of the late John Cobb and Ermie Emerso, also a veteran of the salt will be trying for the same mark in the 272-mph Chet Herbert streamliner that he has refitted with two 450 cu. in. Chrysler engines.

Mickey Thompson's twin-engine car, made famous in 1958 with a top speed of 294 mph on the salt flats, is being refitted with two super charged Corvette engines for attempts on Rudy Caracciola's twenty-one year old Class B record of 286.9 mph.

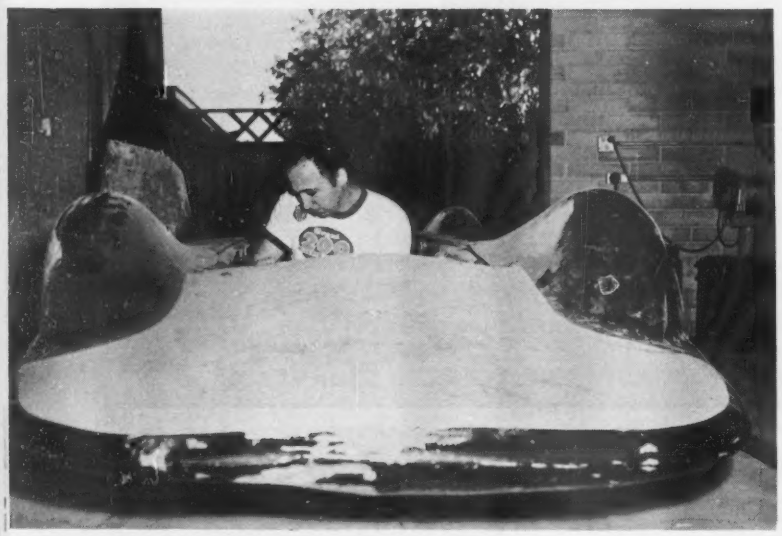
Malcolm Hooper, in the same machine with which he set the above Class C record in 1954, has installed a 470-horsepower Dodge engine with hopes of raising his own record to a point somewhere over 260 mph.

A total of seven different machines are planned for attempts on the small engine records in classes E, H and I, and most of these will be powered by well-timed cycle and modified small car engines.

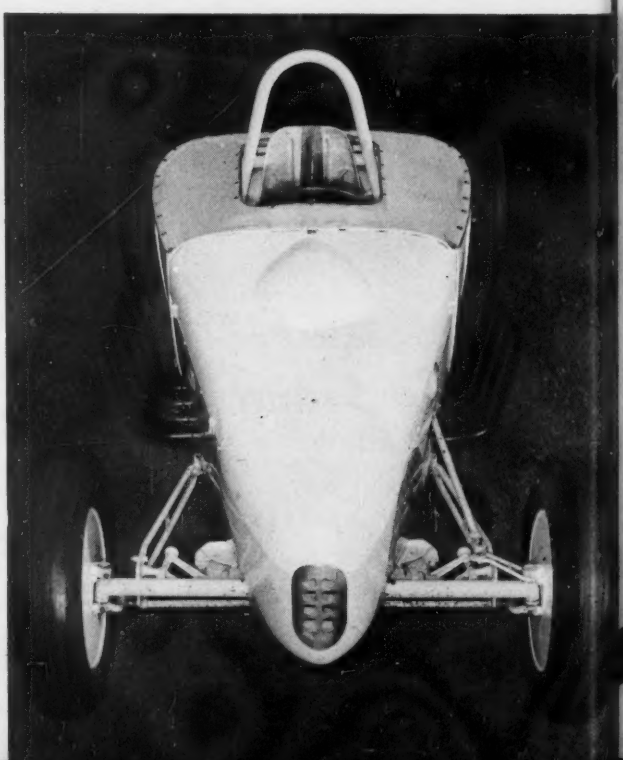
Many of the machines entered in the 1959 event are brand new and others are revamped vehicles, some of them veterans of five or six years on the salt. Most of them are now in final stages of preparation, carefully assembled by the men who built them, and the great salty race course on which they will run is also being prepared; not by man, but by the powerful yet gentle hand of Mother Nature.

The good lady spent centuries in evaporating the water of the great lake, yet each winter she floods it with enough water to level its salty floor. And even during the summer, while speed tests are being conducted, she continues her

Above: This modified sports car is owned by Joe Carboni, and has a Chev engine and Devin body. Turned 165.05 last year. Right: Another entry in the Sports Car class is this Corvette owned by Joseph Duffey of Shelton, Washington.



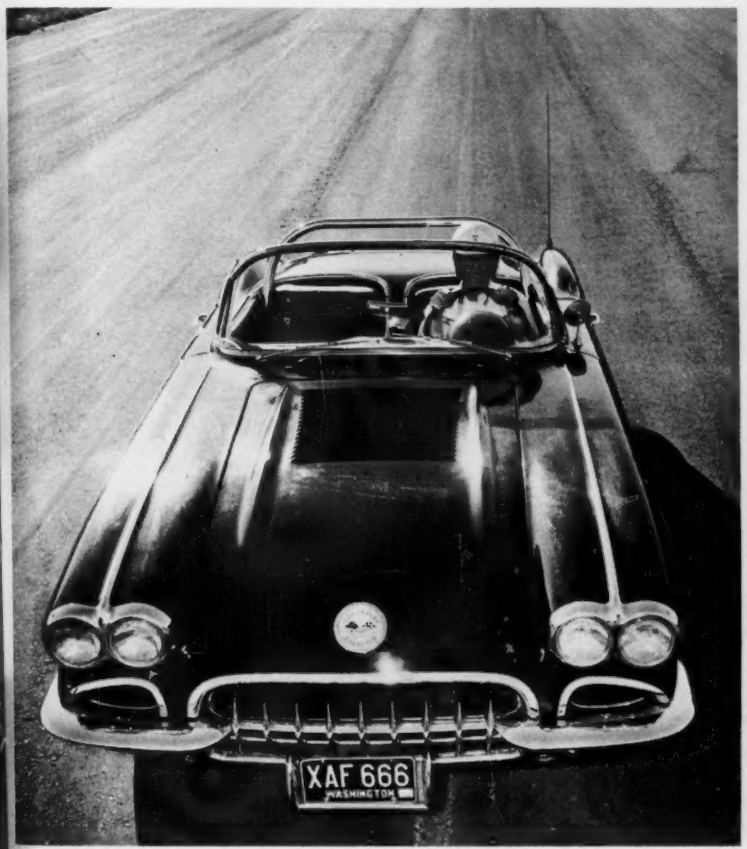
Above: The Emerso-Callahan streamliner being prepared for an attempt on the salt. Power comes from two 450 in. Chryslers. Right: John Cramer's 259 inch Ford Roadster. This car turned 195.54 at the 1958 Bonneville Nationals.



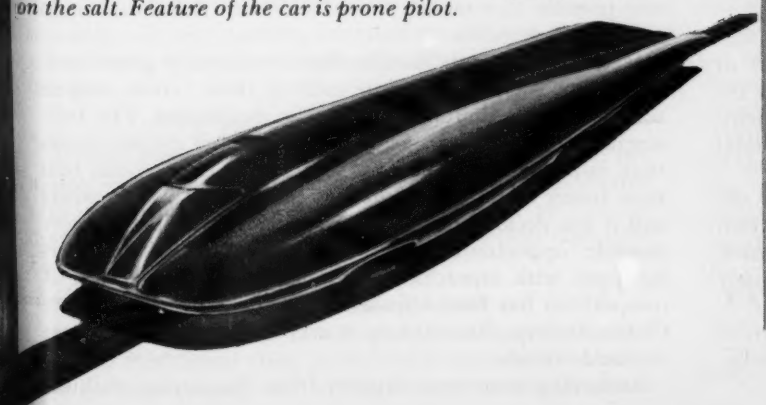
perpetual leveling action as each day the sun draws the water level inside the salt to a point within a few inches of its crusty surface and then at night the water settles again. During summer months the race course section of the salt is so smooth and flat a driver looses all sense of motion in a car travelling at speeds over 100 mph. Thus Nature prepared and continues to maintain the fastest and safest straightaway racing course on the face of the earth.

Measuring from north to south the salty desert extends for one hundred and twenty miles and from east to west it is fifty miles wide. The speed course, about seven miles in from the western-central border of the flats, extends for more than fourteen miles and is almost eight miles wide at its center. Here the salt is over fifty feet thick, though it graduates to a thickness of less than 2 inches at the outer edges.

Back in the early 30's this section of the great desert was given the name, "Bonneville Salt Flats" and use of the flats was controlled by the Bonneville Speedway Association: an organization created by the Salt Lake City Chamber of Commerce for the purposes of protecting the future of this natural phenomena and to serve in assisting speed enthu-



Jerboa streamliner is being built to take small-capacity records on the salt. Feature of the car is prone pilot.



GENERAL SPORTS CAR REQUIREMENTS

S1 SEATS—Passenger's seat must be available for occupancy at all times, but may be covered by a tonneau cover on open cars. Folding seat-backs must be secured so they cannot move.

S2 FUEL—All cars must run on pump gas without any additive.

S3 BODY—Minimum width 42 inches at back of seats. Must have two functional doors suitable for proper entrance and exit.

S4 FENDERS—Wheels must be covered for 120° of wheel circumference measured in a forward direction from the rear of the tire at axle height. No cycle-type fenders will be permitted except those which were factory production installed.

S5 EQUIPMENT—All sports cars must have full equipment suitable for day or night-time highway travel installed and operable at all times, except for permissible deviations specifically noted in the rules governing each category. This will include one spare wheel and tire no smaller than the front wheel and tire and a complete legal electrical installation.

S6 SAFETY REQUIREMENTS—All sports cars must comply with applicable safety regulations T-1 through T-33; see regulation T-6 to determine which cars will require roll bars.

S7 SKIRTS—Wheel covers or undersize cut-outs which restrict normal turning radius (40 ft. minimum) not permitted.

S8 STEERING WHEELS must be full 360° type circular wheel with unrestricted hand clearance around the complete circumference.

TOURING SPORTS

Cars competing in this category must be at least 4-passenger production automobiles of a model of which 500 or more have been produced, having sedan bodies (fixed top or convertible).

Alterations which improve the performance of the suspension and/or brakes will be permitted, as will internal modifications which improve the performance of the engine. Cars having engines with external modifications (including superchargers) must run in either the next higher engine class or in the same engine class in the GRAND TOURING SPORTS category.

No engine substitutions, or body alterations which affect height, width, or contour will be permitted in this class.

Note: Four-passenger cars such as Porsche, Jaguar XK-150, etc., are considered GRAND TOURING SPORTS inasmuch as their rear seats are occasional seats unsuited for continued occupancy by an adult for long distance touring.

There are four engine classes in this category.

TOURING SPORTS CARS	Blown Limit 164.8 cu. in.
☐ C-TS—2701 to 3500 c.c.	(164.8 to 213.5 cu. in.)
☐ D-TS—2001 to 2700 c.c.	(122.1 to 164.7 cu. in.)
☐ E-TS—1301 to 2000 c.c.	(79.4 to 122.0 cu. in.)
☐ F-TS—0 to 1300 c.c.	(0 to 79.3 cu. in.)

GRAND TOURING SPORTS

Cars competing in this category must be production automobiles of at least 2-passenger capacity and of a model of which 50 or more closed body (coupes or sedans) or 250 open body (roadsters or convertibles) cars have been produced.

Alterations which improve the suspension and/or brakes will be permitted, as will internal and external modifications which improve the performance of the engine.

Cars having superchargers (except those transferred from TOURING SPORTS category) must run in either the next higher engine class or in the same engine class in the SPORTS RACING category.

Roadsters and convertibles running in engine classes D, E and F may remove top and windshield and add streamlined head rest, one-man windscreen (See "T-13" and "T-33") and non-rigid tonneau over passenger compartment only.

No engine substitutions, or body alterations which affect height, width or contour will be permitted in this category.

There are five engine classes in this category.

GRAND TOURING SPORTS	Blown Limit 317.2 cu. in.
☐ B-GT—5201 to 7000 c.c.	(317.3 to 427 cu. in.)
☐ C-GT—3501 to 5200 c.c.	(213.6 to 317.2 cu. in.)
☐ D-GT—2701 to 3500 c.c.	(164.8 to 213.5 cu. in.)
☐ E-GT—1601 to 2700 c.c.	(97.7 to 164.7 cu . in.)
☐ F-GT—0 to 1600 c.c.	(0 to 97.6 cu. in.)

SPORTS RACING

Cars competing in this category must be 2-passenger open or closed sports cars with seats located side by side and on either side of the center line. The body must be constructed of rigid non-flammable material.

Cars having engines equipped with superchargers (excepting those transferred from GRAND TOURING SPORTS category) must run in the next higher engine class.

There are five engine classes in this category.

SPORTS RACING	Blown Limit 427 cu. in.
☐ A-S—7001 c.c. & up.	(427.1 cu. in. & up)
☐ B-S—5201 to 7000 c.c.	(317.3 to 427 cu. in.)
☐ C-S—3501 to 5200 c.c.	(213.6 to 317.2 cu. in.)
☐ D-S—2701 to 3500 c.c.	(164.8 to 213.5 cu. in.)
☐ E-S—0 to 2700 c.c.	(0 to 164.7 cu. in.)

EXISTING BONNEVILLE NATIONALS SPORTS CAR RECORDS

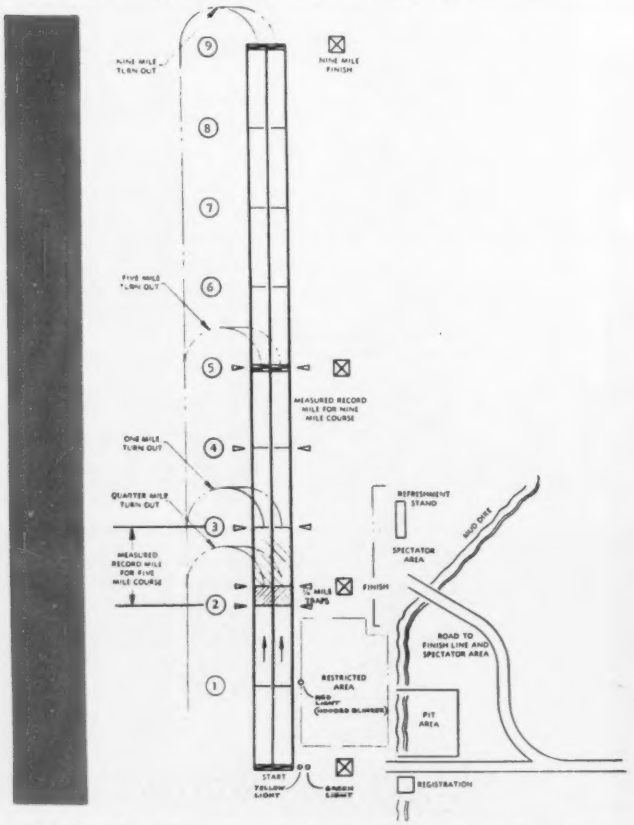
Class	Name	Year	MPH
Touring Sports			
"C-TS"			Open
"D-TS"			Open
"E-TS"			Open
"F-TS"			Open
Grand Touring Sports			
"B-GT"	Southard & Heboian	1958	162.602
"C-GT"	George F. Hansen	1957	144.322
"D-GT"	Albert L. Schmidt	1957	150.647
"E-GT"	Wayne Stanford	1958	110.552
"F-GT"	Porsche Carrera	1958	114.157
Sports Racing			
"AS"			Open
"BS"	Barnes, Larsen & Dauphin	1957	178.048
"CS"	Frank Arciero	1957	176.913
"DS"	William B. Scace	1958	143.191
"ES"	Porsche Spyder 550rs	1957	135.772

siasts from all over the world in the organization and control of speed record attempts made there.

The amateur racing enthusiasts of this country began using the salt flats back in 1949 for organized speed trials and since then the Bonneville National Speed Trials organization has played host annually to the nation's fastest cars. During the past ten years the top speed mark has been raised from 193 mph, set in 1949 by the team of Dean Batchelor and Alex Xydias, to its present level of 294 mph. This latter mark was established last year by California's Mickey Thompson in his twin-Chrysler powered experimental machine.

All indications for the 1959 Nationals seem to point to minimum top speeds, for a number of cars, of well over 300 mph. Two such cars are in final stages of preparation and three more are being constructed. In hundreds of backyard garages and small shops in various sections of the country chassis builders work late into the night, every night, completing machines that will compete in fifty-one various classes of competition during the 1959 Speed Trials. In a like number of shops engine builders are making final dynamometer tests to bring powerplants up to maximum output.

Thus, the stage is being set for what promises to be America's greatest collective attack on established speed records. The sun shines brightly over the great white flats and the reflected heat of its rays rebounds into the sky to hold back rain clouds that shadow the surrounding mountains. And at night the flats lie deathly still as the sun-raised water in its body settles slowly back into its depths. But a man, standing there in the moonlight now might hear ghostly echoes of lathes turning in California; of metal being ground smooth on an emory wheel in Oregon; of frame tubing being shaped and welded in Texas; of rivets being flattened in Oklahoma; of fiberglass being sanded smooth in Ohio and Florida; the rattle of chain hoists as engines are lowered into chassis and the sounds of hand tools and sweating men preparing their cars in New York. He might close his eyes and visualize the hundreds of geographically separated scenes where men bend to their work under hooded bulbs; each striving to make his machine safer and



slowly — but there is satisfaction in knowing they do turn and that full international recognition for this country's amateur speed enthusiasts is now being considered. By the time this story is read the name of the meet might well be the Bonneville International Speed Trials.

RULE CHANGES

The third and probably the most difficult phase of Bonneville's face lifting program was a complete overhaul of the classification rules. Some classes, after ten years on the salt, had become obsolete. Furthermore, new developments in engine and chassis design created a demand for additional classes.

The directors approached the problem with three objectives in mind: 1. To create a whole new classification system that would offer equal competition in all classes. 2. To change all class letter designations to more closely coincide with FIA recognized engine size classifications. 3. To establish a separate set of rules and regulations for owners of sports cars; for their participation in the event was becoming more popular each year.

1. ALL NEW BODY CLASSES

A search was made of the complete entry lists of the past ten years and by studying it the directors not only discovered in what classes enthusiasm was dropping but in what direction the present trends in chassis design might lead. Thus it was possible to establish new classes with definite thought toward future needs.

Ten separate body classifications (excluding sports cars) were established and within each of these certain engine size classes and limitations were also established. The fully streamlined machine category received more engine classes than other body divisions for it is within these classes that most future attempts on International records will be made and it was decided that enthusiasts should be allowed every possible opportunity. The old rule of advancing cars equipped with superchargers into the next higher class of competition has been eliminated in all of the Streamliner Classes. Perhaps this will help to stimulate even more interest in world records.

Answering numerous requests from drag-racing enthusi-

faster. The stage is thus set and the players, each in his own shop, study and work to prepare for the various roles they will play when the curtain rises over a crowded starting area on Sunday, August 23, 1959.

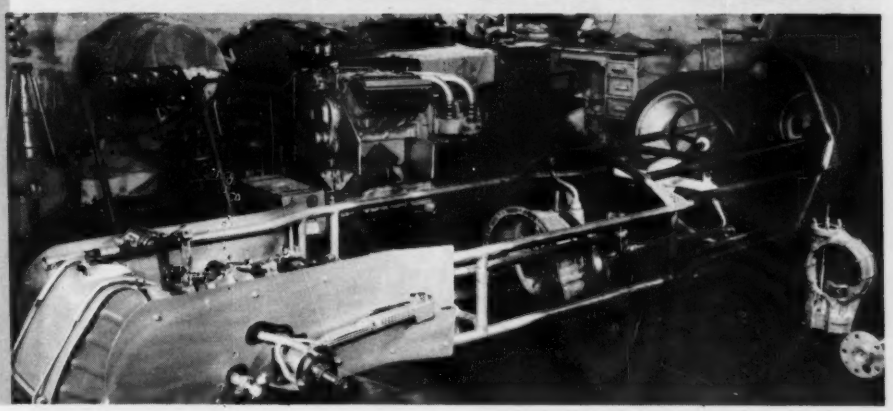
During the winter months, while the salt flats were flooded and the individual racing enthusiasts were laying plans for the '59 season, six other men met one night a week and over their heads the midnight oil also burned; many times until the first gray streaks of dawn filled the sky. Upon their collective shoulders falls the responsibility of organizing and conducting this most ambitious of all annual racing meets, and even though the 1958 meet was considered one of the most successful in the history of the event, all six men of three major improvements that could be made to make the 1959 meet even greater.

CHANGE OF DATES

First of all the dates of the meet conflicted with those of other annual racing events so the directors moved the '59 meet one week ahead on the calendar with the dates now set at Sunday, August 23rd through Saturday, August 29th. With this change participants now have the opportunity to run for a full seven days on the salt and then have five days in which to reach the annual drag racing meet of their choice; or seven days to reach any of the major sports car races scheduled for Labor Day weekend.

FIA RECOGNITION

The next proposed improvement was one that many enthusiasts had dreamed about for years. To achieve international acclaim through full F.I.A. Recognition had always been regarded as a remote and costly project; but with many cars being prepared expressly for attempts on world records, the directors felt it was time to take definite action. Miles of red tape have been traversed and progress is being made. Through the combined efforts of SCI's Griff Borgeson, John Christy, SCI's Editor, George Hill, Bonneville National's Public Relations Director and through the cooperation of officials of the Automobile Competition Committee for the United States (FIA) the possibility of full FIA Recognition for the Bonneville Nationals is now far from being a remote dream. The wheels in Paris turn



Far left: Plan view of the Bonneville layout. Length is over fourteen miles. Upper right: Two sports car entries belonging to William Scace, Illinois. Lower right: Streamliner chassis being readied for '59 Bonneville Nats by Romeo Palamides, Oakland, California. Power is by a blown 500 cu in Chrysler.

in categories using pump gasoline only for fuel. Three asts new classes were opened for altered coupe-sedan owners classes were also opened for dragsters but with no restrictions as to type of fuel used. Dragster owners are allowed to equip their cars with bodies that fully enclose the rear wheels and driver; some of them will be used in attempts on the world's standing mile and standing kilometer records and the added streamlining thus allowed will automatically increase their speeds.

2. FIA ENGINE CLASSES

All FIA engine size classifications were adopted with two minor exceptions where stock-bodied machines dominated very popular existing classes. For the latter, two classes designated CX and BX, were established within respective FIA classes C and B.

3. SPORTS CAR CLASSES

A whole new system of classifying sports cars at Bonneville has been established after giving due consideration to every type sports car being used in this country. While all classes do not coincide exactly with FIA they do fit the engines that compete on the closed road courses and at Bonneville. These new rules are included in this article for all sports car owners who may wish to attend the speed trials this year.

A great deal of thought went into the new sports car rules, and while some of the small car classes may have little to offer in the way of fantastic speeds more than enough emphasis has been placed on the large, Sports Racing category and the powerful "Specials" that are currently appearing on the closed courses.

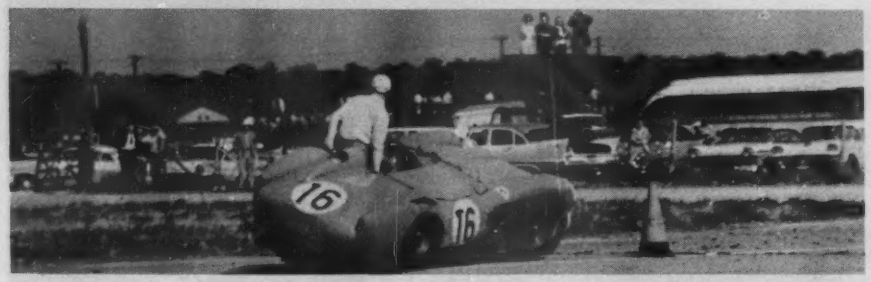
With these new classification rules; with the new dates for the meet; with the promising possibility of FIA Recognition; and from the looks of the fabulous machines that are nearing completion — it appears the 1959 Bonneville National Speed Trials will be the greatest in the history of the event.

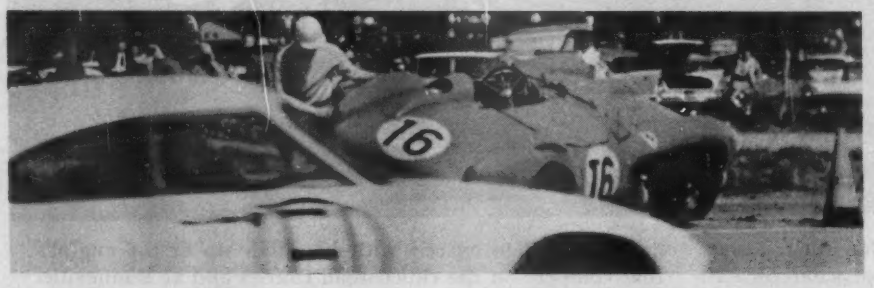
For further information about rules and classes, for Official Entry Blanks and for a list of existing two-way average records in all classes, write to: Bonneville Nationals, Inc., 9030 Costello Ave., Van Nuys, California.

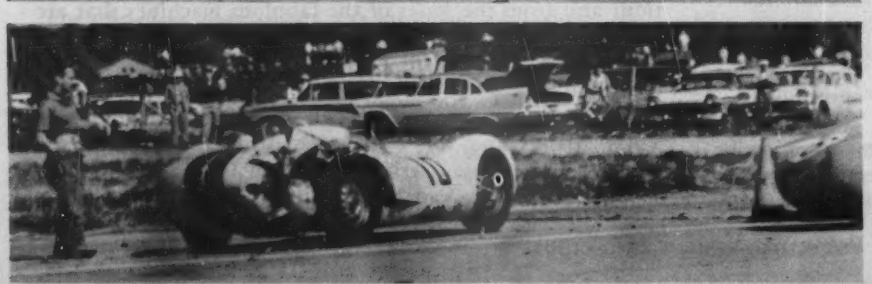
—gh

by Donn Hale Munson

A Comet Called Archie







► The sleekly fierce Syracuse Connaught GP car howled down the straight, its driver sitting well forward but relaxed. The engine screamed defiantly as a final burst of throttle was fed to it. All over the Aintree pit area stop watches clicked as the car flashed across the start-finish line. Timers compared watches and startled glances.

"Two, three point eight . . . right?"

"Quite. Better than two full seconds faster than Tony Brooks. Don't know how that little bloke does it."

"Oh, Archie puts his foot in it. Very aggressive, y'know."

The Connaught wound down on a cool off lap and wheeled into the pits. The driver that crawled out looked anything but aggressive. Scant inches over five feet tall, he limped heavily away from the car pulling off his helmet to expose long brown wavy hair that immediately tumbled over a wide smooth forehead. Behind his sunglasses gentle dark eyes crinkled in a fair-skinned face. A full-flowing Royal Air Force type mustache curled upward at the corners of his mouth.

But these were the things you noticed only on close inspection — for it was his rolling, limping gait, the width of his shoulders and the bulk of his biceps you saw first. Then you saw his forearms. And, if you were seeing him for the first time, you involuntarily gasped. Because his right arm ended abruptly in a stub near the elbow.

Archie Scott-Brown looked like anything but one of the best GP and sports-car drivers in the world. Yet for almost five years he was to flash comet-like across the international racing scene to chalk up an amazing record, despite physical handicaps that would chain a lesser man to a wheelchair.

He was born to an uphill fight in Pais-

ley, England, May 13, 1927. The biological fates that match genes and hormones to produce the agile brains, keen intellect and superb reflexes in sturdy bodies to create racing drivers played a dirty trick on William Archie Scott-Brown. They gave him the brains and spiritual make-up but put them in an incomplete body . . . one leg too short, one arm without a hand.

A competent psychologist would recognize the force that moved young Archie as "compensatory". To make up for his handicaps, the little Englishman faced life with fierce determination that showed early in boyhood. He played a rugged game of soccer type football, charging hard, playing it smart to compensate for lack of speed.

To a psychologist it would be significant that being retarded by his limp, he craved speed. A psychologist could also probably make something of the fact that one of the favorite games of the young boy Archie was "war."

He decked himself out in tin helmets, strapped wooden guns to his waist and led imaginary troops into battle. And a few years later he saw his friends go off to face the real thing during Britain's struggle for survival in the early days of World War II. He wanted, of course, to be a Spitfire pilot. But the RAF demanded physically perfect candidates. Archie stayed home.

The end of the war opened a way for the teen-aged Archie to find the speed he so fervently wanted. Gasoline rationing ended and once again through England sports and racing car engines burst into their siren songs. Archie answered as best as he could, dicing the family sedan on back roads, competing in rallyes and trials, gymkhanas and any other event that would accept the entry of a boy who wedged the stump of one strong arm between the spokes of his steering wheel while he put his foot into it.

They began to talk about him in England, this young Archie Scott-Brown who could wheel an MG around a small club circuit with the best of the post-war amateurs. On the course he would settle his thick-set stubby body behind the wheel, gripping it strongly with his one hand and using his stump as a lever. He was lightning fast on shifts, slipping up and down gears with amazing coordination. But, more impressive, he kept the throttle well down. Archie wanted speed and he got it.

Search the records today and you will not find the name of the man who gave him his first real ride. But admiring English owners, reflecting their traditional respect for sporting ability — handicap or no — put Archie behind the wheel of fast cars. And he drove them to victory.

Skip a few years and many miles of competition driving. Behind him now lies a 1955 record of many wins . . .

First in sportscars at Snetterton, first in the British Empire Trophy Race at Oulton Park, first in two liter cars at Goodwood, first in unlimited cars at Snetterton and second in Formula I's . . . more victories at Brands Hatch, Crystal Palace, Charterhall . . . big cars, little cars, good cars and dogs, Archie drove them all.

Now it is 1956 and Archie, sporting the big brown RAF-type mustache that is his personal trade-mark, is at Silverstone for the International Trophy. It's the first British Racing Driver's Club meeting of the year. The International is sixty laps — 180 miles — around the three-mile circuit.

The weather this May day is cool and dry. The course is fast and the big boys are here . . . Moss, Hawthorne, Salvadori, Schell, Collins, Parnell . . . yes! even the maestro himself, Juan Fangio. Is it possible the crippled kid has beaten down his handicaps to face company like *this*? He has!

And now Arche sits behind the wheel of a Connaught, a powerful and speedy Formula I job of two and one-half liters. Fourteen of the fastest cars in the world are on the grid. In the front row on the pole is Moss on a Vanwall. Beside him are Schell, also on a Vanwall, Fangio on a Ferrari and Hawthorne on a B.R.M.

Collins (Ferrari), Salvadori (Maserati), and Archie make up the second row. Behind is the rest of the field . . . four more Connaughts, a Cooper-Bristol, two Gordinis and a Maserati, all in the hands of ace drivers.

Electric starters moan dully and crews scurry to the trackside as engines catch and snarl. They rise in a screaming crescendo as the starter's flag raises, then suddenly drops.

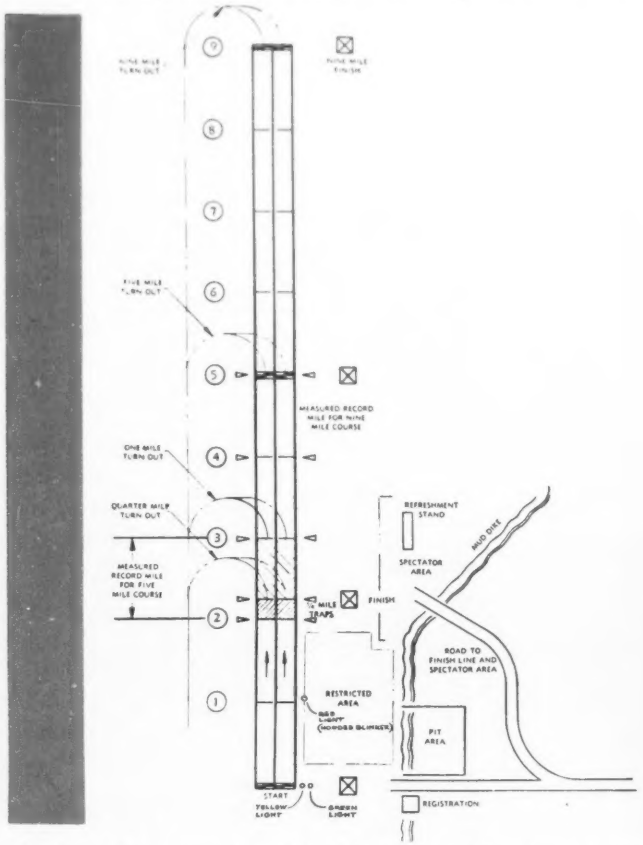
Fangio gets off for a maginficent start. But almost immediately Hawthorne passes him. Archie puts his foot down but the front row boys hold the lead spots. Hawthorne's B.R.M. grabs the lead for five laps, seven seconds ahead of Fangio. Moss pushes the Argentinian hard and catches him. Round and round they go, power-sliding through Copse Corner, twisting through Maggots curve, Becketts Corner and Chapel. Then tearing down Hangar Straight to stand up on the brakes at Stowe Corner.

Archie roars into Club Corner, shifts fast, and tromps on the throttle again to barrel down the straight to gentle Abbey Corner and then wrench the Connought through Woodcote Corner past the stands and pits.

(Continued on page 82)

mark was established last year by California's Mickey Thompson in his twin-Chrysler powered experimental machine.

All indications for the 1959 Nationals seem to point to minimum top speeds, for a number of cars, of well over 300 mph. Two such cars are in final stages of preparation and three more are being constructed. In hundreds of backyard garages and small shops in various sections of the country chassis builders work late into the night, every night, completing machines that will compete in fifty-one various classes of competition during the 1959 Speed Trials. In a



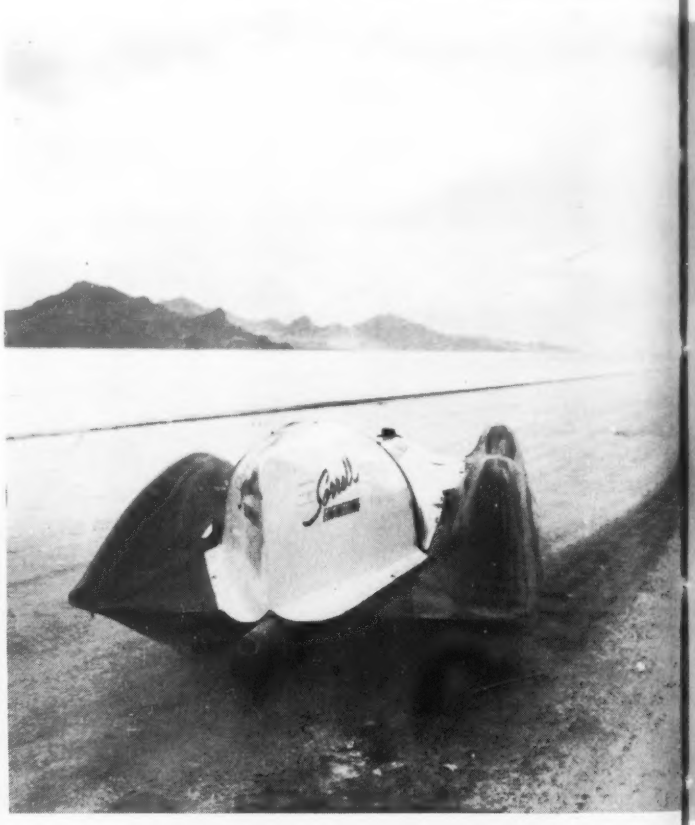
slowly — but there is satisfaction in knowing they do turn and that full international recognition for this country's amateur speed enthusiasts is now being considered. By the time this story is read the name of the meet might well be the Bonneville International Speed Trials.

RULE CHANGES

The third and probably the most difficult phase of Bonneville's face lifting program was a complete overhaul of the classification rules. Some classes, after ten years on the salt, had become obsolete. Furthermore, new developments in engine and chassis design created a demand for additional classes.

The directors approached the problem with three objectives in mind: 1. To create a whole new classification system that would offer equal competition in all classes. 2. To change all class letter designations to more closely coincide with FIA recognized engine size classifications. 3. To establish a separate set of rules and regulations for owners of sports cars; for their participation in the event was becoming more popular each year.

water in its body settles slowly back into its depths. But a man, standing there in the moonlight now might hear ghostly echoes of lathes turning in California; of metal being ground smooth on an emory wheel in Oregon; of frame tubing being shaped and welded in Texas; of rivets being flattened in Oklahoma; of fiberglass being sanded smooth in Ohio and Florida; the rattle of chain hoists as engines are lowered into chassis and the sounds of hand tools and sweating men preparing their cars in New York. He might close his eyes and visualize the hundreds of geographically separated scenes where men bend to their work under hooded bulbs; each striving to make his machine safer and



1. ALL NEW BODY CLASSES

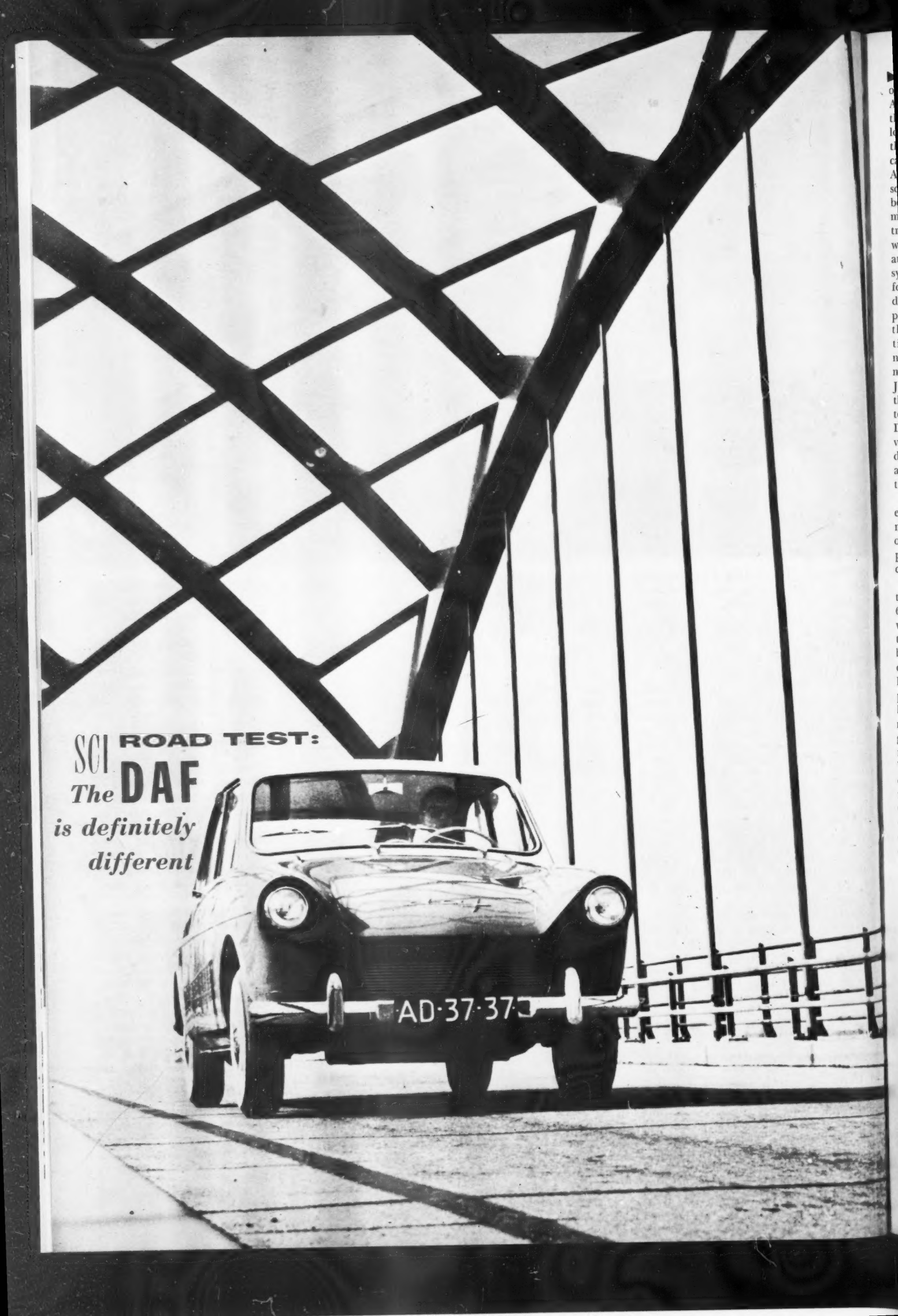
A search was made of the complete entry lists of the past ten years and by studying it the directors not only discovered in what classes enthusiasm was dropping but in what direction the present trends in chassis design might lead. Thus it was possible to establish new classes with definite thought toward future needs.

Ten separate body classifications (excluding sports cars) were established and within each of these certain engine size classes and limitations were also established. The fully streamlined machine category received more engine classes than other body divisions for it is within these classes that most future attempts on International records will be made and it was decided that enthusiasts should be allowed every possible opportunity. The old rule of advancing cars equipped with superchargers into the next higher class of competition has been eliminated in all of the Streamliner Classes. Perhaps this will help to stimulate even more interest in world records.

Answering numerous requests from drag-racing enthusi-

SCI ROAD TEST:

The DAF is definitely different



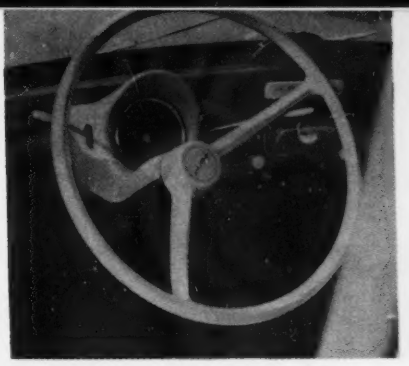
▶On April 23, more than a year after its official debut at the Dutch motorshow in Amsterdam, the first DAF sedan rolled off the production line at Eindhoven. The long delay led many people to believe that the factory had run into trouble with the car's rather unusual V-belt transmission. A few European auto journalists even went so far as to predict that the DAF would not be produced with the automatic transmission. The "Variomatic" drive (a DAF trade name), however had nothing to do with the long pause between introduction and production. The two pedal control system had been proven many months before the first prototype saw the light of day. The engineers at Eindhoven had a problem, but it had nothing to do with the transmission. They had spent the time perfecting production line techniques for the little DAF that would permit construction of 200 cars a day by next January. The factory space to be used for this new venture had been turning out 60 to 70 trucks a week, and consequently the DAF had to be integrated with this heavy vehicle production. Now that this has been done successfully, little DAFs, with fully automatic belt drive, will be pouring from the factory in ever increasing numbers.

To gain first hand knowledge of the first economy car with an all automatic transmission, Dr. Huub van Doorne, president of DAF, agreed to give us one of the first production cars—in fact the third car to come off the line—for a full road test.

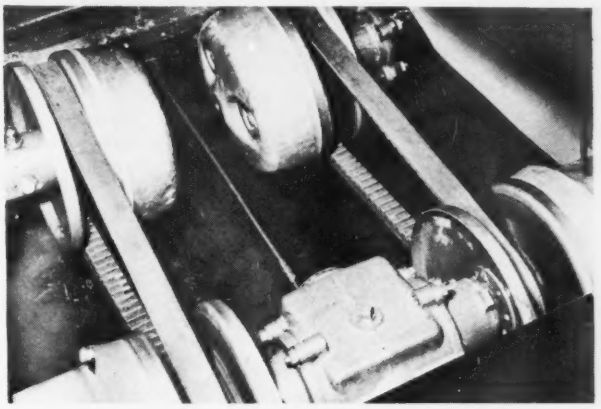
When the fire-engine red test car was turned over to us it had been driven about 600 miles. The DAF engineers, however, were very explicit in their instructions not to spare it, and to treat it like a fully broken in example of the mark. They could give us these instructions without having to worry about our producing expensive noises in the engine compartment because the Variomatic transmission will not permit the driver to over-rev the engine. Just to make doubly sure, the slide rule boys at Eindhoven have hooked their V-belt drive to a two-cylinder air-cooled engine with oversquare dimensions that make it virtually unbreakable. This little 600 cc powerplant produces 22 bhp at 4000 rpm. From the power rating it is quite evident that the designers have kept output low in order to get the utmost in engine reliability and longevity.

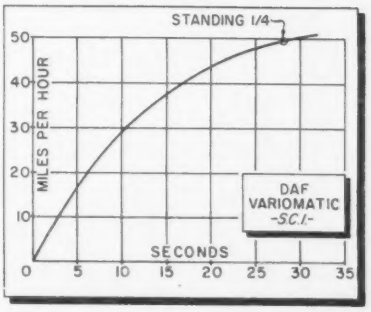
Under normal road conditions maximum rpm will never be attained. At full throttle for example the engine will be turning over at some 3700 or 3800 revs, which corresponds to a road speed of about 55 mph. Only downhill or with a strong tail wind can you exceed this rev limit. The combination of an air-cooled two-cylinder engine mounted in a small car of unit construction conjures up all sorts of ideas about noise and vibration. Much to the designers' credit, the little four-stroke twin does not transmit undue amounts of sound and/or vibration to the passengers. Fairly supple engine mounts and the V-belt drive are two good reasons for the car's low sound level. Noise is also eliminated by having the power plant mounted up front, thus doing away with the need for a fast turning shrouded fan, which is a grand little set-up for the production of whines and whistles.

(Continued on page 88)

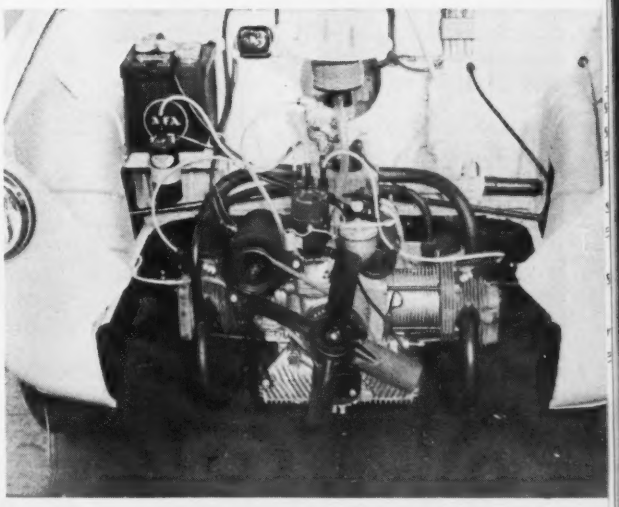


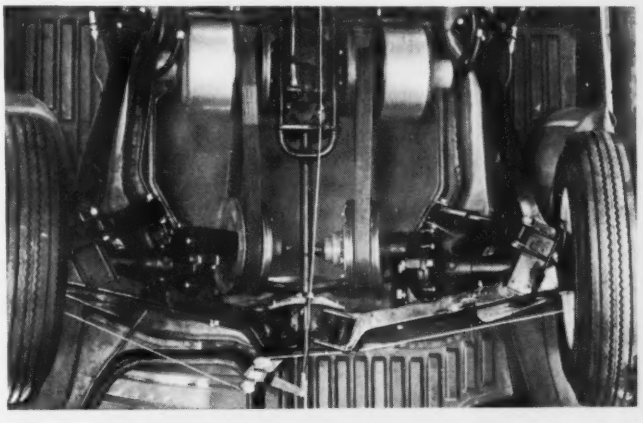
DAF interior and instruments (top) are neat and simple. Car (left) has more than enough road adhesion to cope with torque developed by two-lunger engine. Variable diameter pulleys (below) are the heart and soul of the DAF's automatic rubber-belt transmission.





Air-cooled two cylinder engine (right) couldn't be easier to get at for repairs and up-keep. Rear wheels are independently sprung (below) by combined A-frames and radius arms.





SCI builds a TRIUMPH TR3 for

By Donald G. Typond

According to sales figures the Triumph is a very popular sports car, both for road use and for racing. The latter purpose has been taken into consideration by the factory and the cars are available with various optional competition items. These extras, although nice to have, do not however make the difference between a raceable Triumph and a street machine. Careful engine preparation is the most important thing.

With this in mind SCI decided to prepare a Triumph TR-3A as the second car in a series of articles on how to set up various production cars for competition. Finding a Triumph was an easy job . . . it belongs to one of our staff. For our purposes the car was a perfect specimen; dead stock, with nothing done to it in 10,333 miles except the factory recommended valve job at 5,000 miles. Optional equipment as purchased included competion shocks and springs, overdrive, 4.11 rear axle ratio and wire wheels.

The car was delivered to Ed Brown of Belleville, New Jersey with instructions to set it up for racing *without* destroying its ability to haul groceries and do other utilitarian tasks. In other words, build in more reliability and power but keep out undesirable temperament.

With this in mind the engine was pulled from the car by first removing the hood, nose shell and radiator, a necessary operation since the nose shell extends too far to the rear. A chain hoist was placed over the engine and a lifting cable was secured to two of the head studs. Without any extraordinary strain the engine was extracted. This procedure, along with most of the work that is to follow, is covered in detail in the Triumph shop manual, without which the job should not be attempted.

Next, the engine was placed on a bench and completely disassembled. All parts were inspected for wear (by measurement) and cracks (by Magnaflux and Zyglo or similar methods). Unsatisfactory parts were replaced. The clutch, after about 10,000 miles of city traffic driving, was found to be worn so a new pressure plate, friction disc and release bearing were in order. The exhaust valves did not meet with Ed's approval and this was duly noted on the list. Next, the valve springs were tested and found to be weak so new springs were ordered. Although the original bearings were satisfactory for street use, it was decided to replace them with new bearings to insure reliability under racing conditions.

To the list was added the standard items such as a full set of gaskets, the Triumph overhaul set, and four new connecting rod safety locks.

The crank was found to be in perfect condition, unscored and shiny. The rods were in perfect alignment and showed no flaws. Next checked were the pistons and cylinder sleeves. No signs of scuffing or excessive wear were evident there. And so it went . . . all items and parts checked for flaws that could lead to very costly repair work at a later date. After the inspection was over the list of needed parts remained as it was in the preceding paragraph.

The next step was to have the balancing work done. Pistons, wrist pins, connecting rods, crank, flywheel and clutch were delivered to the clinically clean shop of Dick Simonek, located in Paterson, New Jersey. Dick's assistant, Ed Bell, began the job by balancing the connecting rods. The caps are secured to the big ends and the rods are placed, one at a time, on a rig that holds the small end while the big end is weighed. The weights are recorded and then the rods are checked against each other for difference in overall weight. The lightest rod is left alone and the others are lightened to match it, both in overall weight and end-for-end. Excess metal is ground off until all the rods are similar to a tolerance of 1/10 of a gram, or .035 ounces.

The pistons and their respective wrist pins were balanced to the lightest one by removing metal from the flange on the inside of the skirt. During the operation the wrist pins were left in so that the total weight would be the same for all four assemblies.

Next, the crank was placed on a machine that looks rather like a large engine lathe but is actually a printing press. At least that's what Dick calls it. At any rate it does a great job of indicating both static and dynamic imbalance in a rotating mass, and shows the position and amount of weight that must be removed. It must be noted that *we* couldn't interpret it, but to Mr. Simonek it presents no mysteries. One small hole drilled in the crank was all that was needed for perfect balance.

(Continued from page 90)

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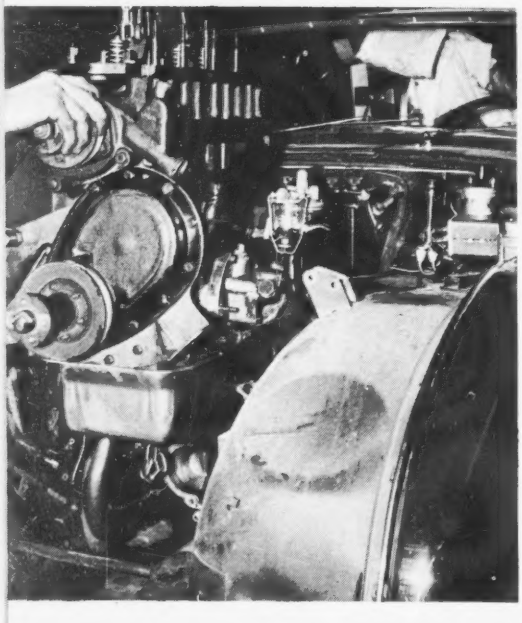

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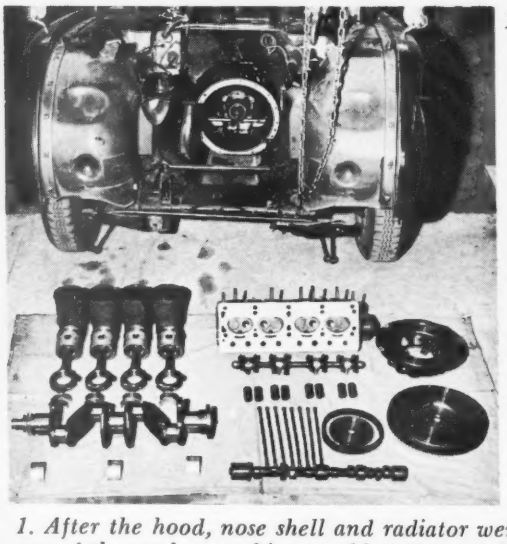

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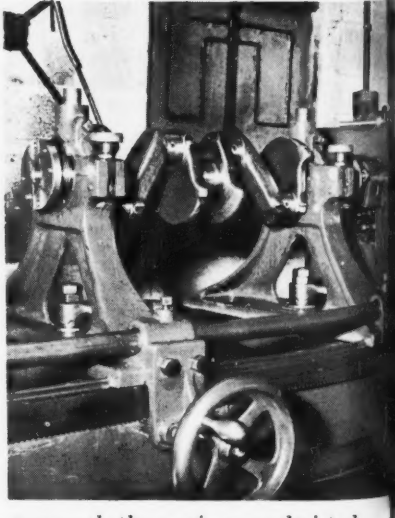
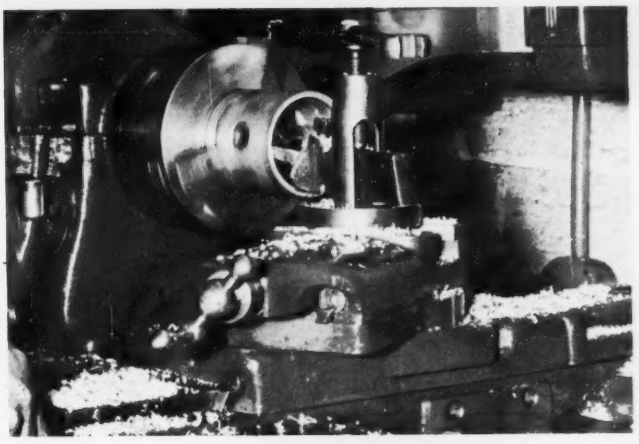


1. After the hood, nose shell and radiator were removed, the engine was hoisted out of the car by attaching a cable to two of the head studs.

competition



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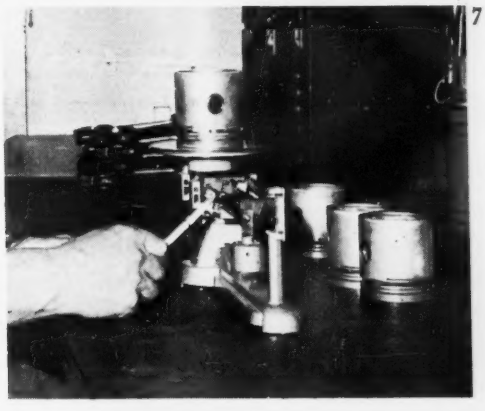

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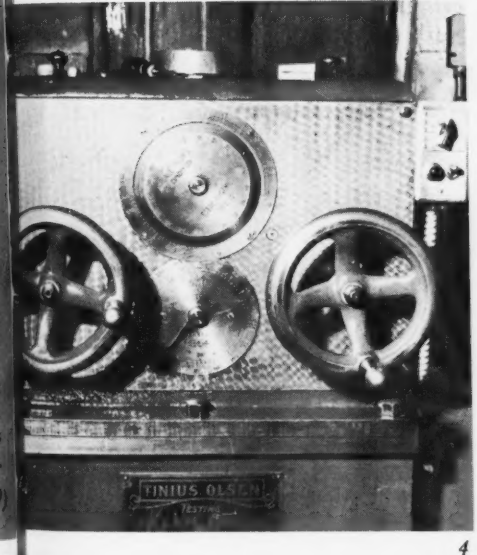

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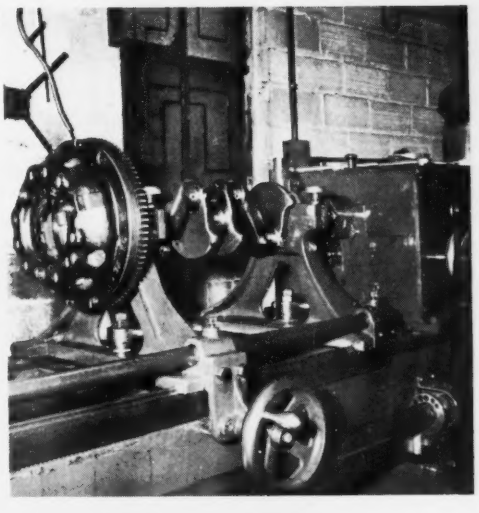

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2. Shown here all spread out, the parts were inspected for wear and possible fatigue.

3. The crank was placed on the balancing machine, and imbalance was shown on the gauges in figure 4. After the crank was drilled for balance, the flywheel was added, then the clutch assembly. When the job is complete, the parts are coded for proper assembly later.

5. Dick Simonek is shown here drilling the crank, which required only a small hole to balance it.

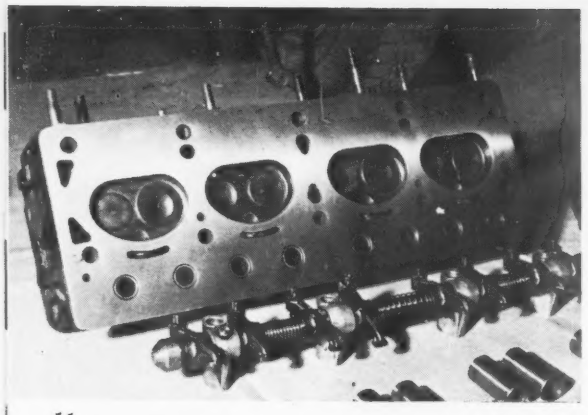
6. The flywheel and clutch are here mounted on the crank, and the entire assembly balanced.

7. The pistons were weighed against each other and the weights recorded.

8. Material was cut from the inner flange of the skirt. Notice that the wrist pin is in place so that the total weight of each piston assembly will be the same.

9. The rod big ends were weighed on a rig that supports the small ends. After the data is recorded, the overall weight is recorded.

10. Ed Bell is shown grinding metal from the meaty bottom end until all rods are equal, both in overall weight, and end-for-end.



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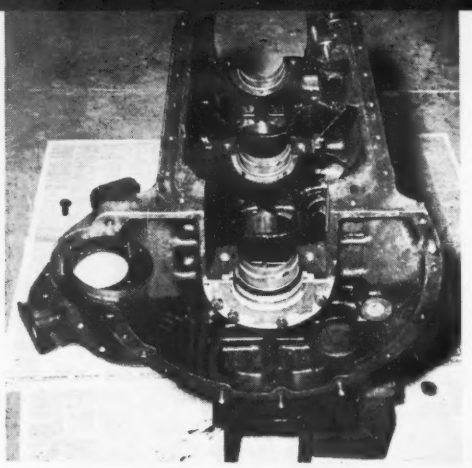

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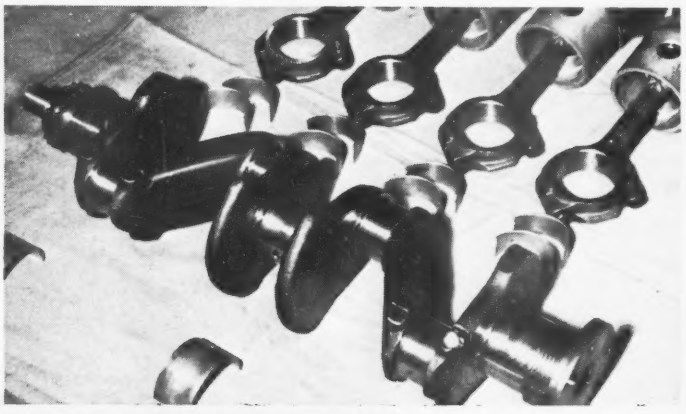

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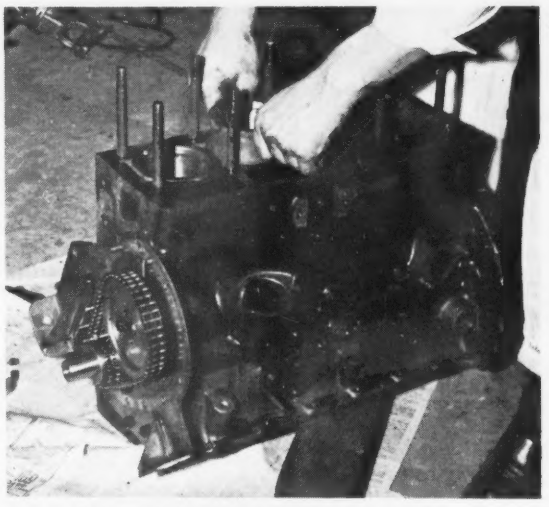

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11. A light cut was taken on the head to true it up and eliminate any roughness or pits. The combustion chambers were cleaned up to eliminate hot spots.

12. The crank after balancing. Note the hole drilled in the web behind #4 journal.

13. Here the block is ready to receive the crank.

14. Glen Carlson, Ed Brown's associate, is shown tightening the main bearing caps to factory torque specs.

15. The block was then turned over and the cylinder sleeves installed.

16. A large socket was attached to a head stud to retain the sleeves and keep them from moving while the pistons were installed.

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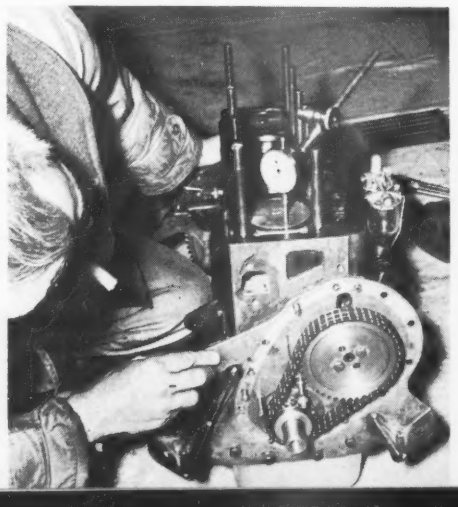
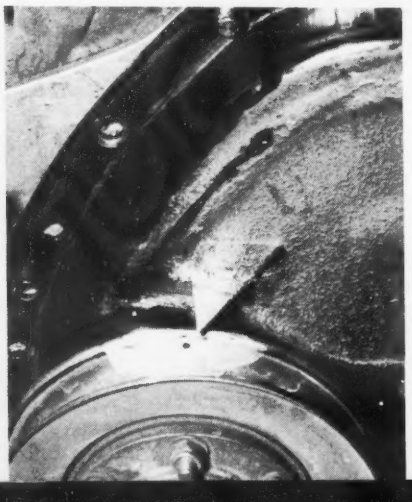
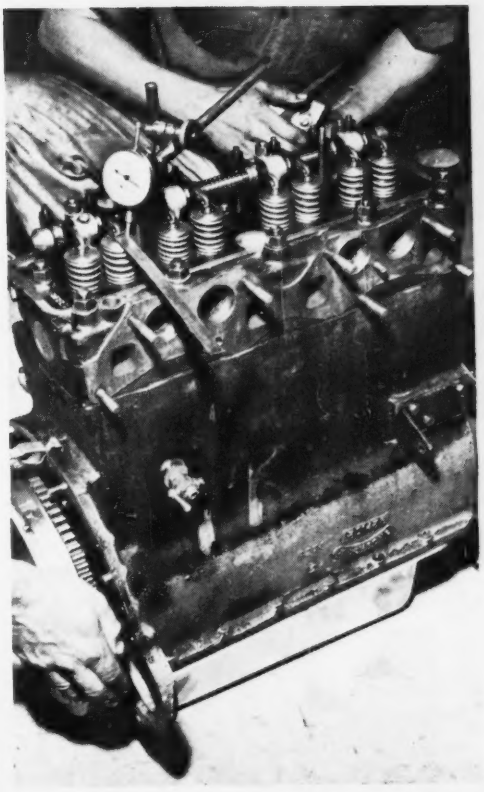




17. A dial indicator is used to locate top dead center. Ed Brown, with cigar, is shown doing this.

18. After finding TDC it was found that the factory timing mark, a hole in the pulley, was not in proper alignment. If it were to be used for future timing operations, the timing would not be correct.

18



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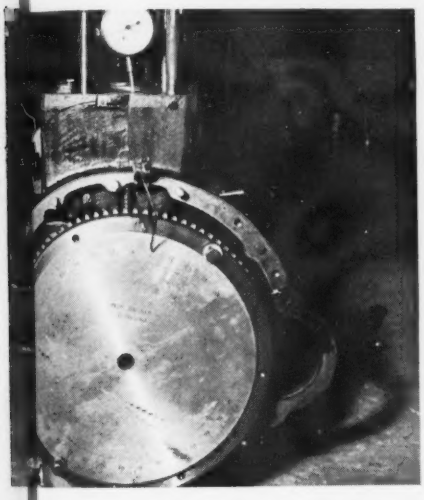

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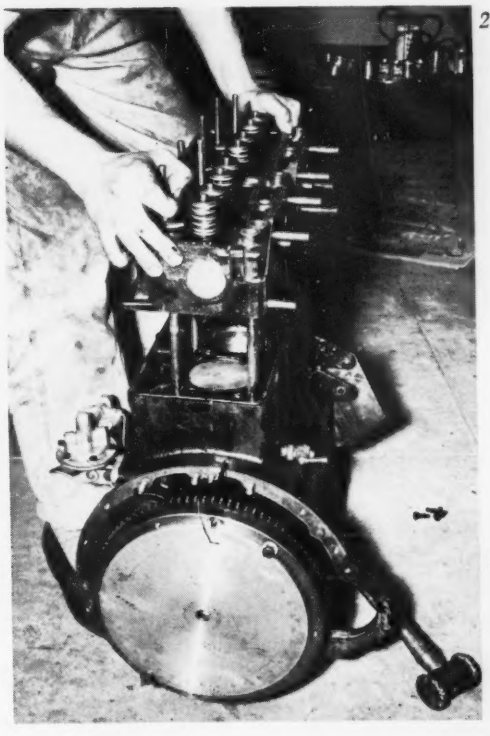

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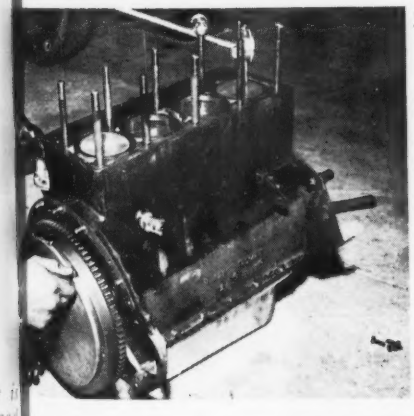

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23. With a .015 feeler gauge, valve clearance, for timing purposes only, is set. Then, as explained in the text, the valve timing is checked using the dial indicator and degree wheel.

24. Before the manifolding and accessories are attached, the engine is reinstalled in the car.

25. To complete the job, Alfin brake drums were installed on the rear wheels.

26. With all preparation completed, the car is ready to roll out of Ed's shop. On to the races. . . .

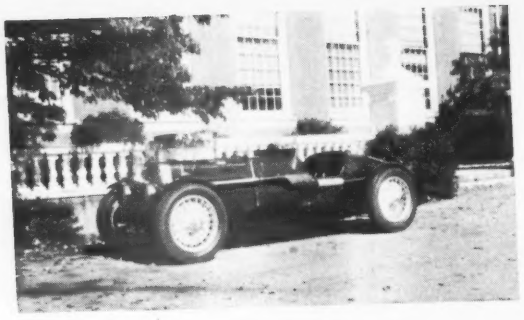
26

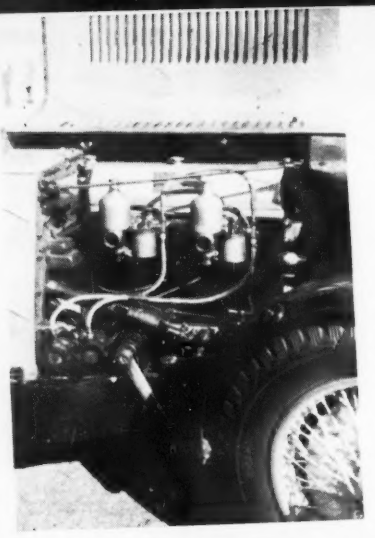
19. A new mark was filed on the pulley and will be used for all future timing operations.

20. A degree wheel was bolted to the flywheel prior to the valve timing operation.

21. With the dial indicator on #4 piston, a wire indicator was set to zero on the degree wheel, with the piston at TDC.

22. The head was then bolted into place using factory torque readings.

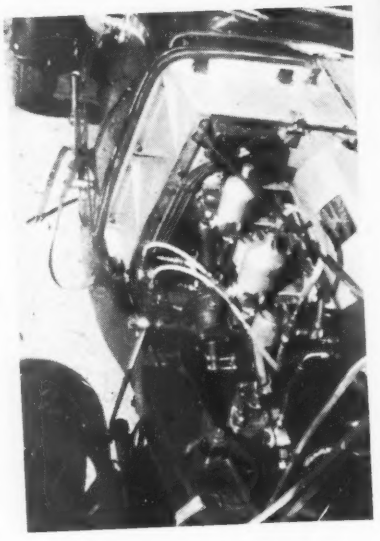


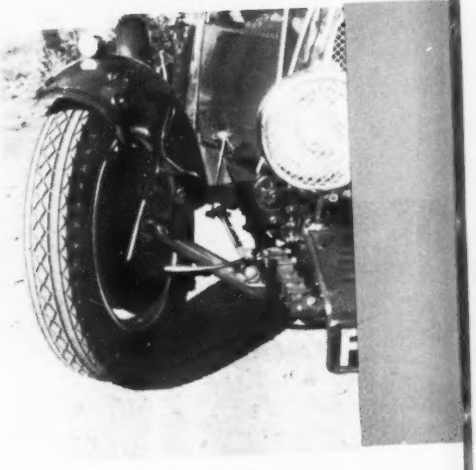


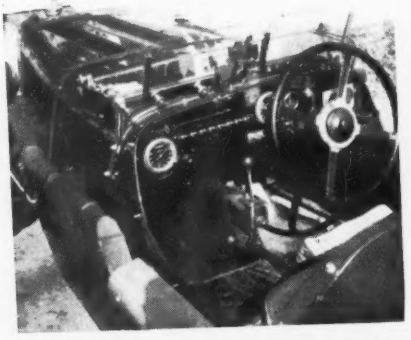
by Karl Ludvigsen

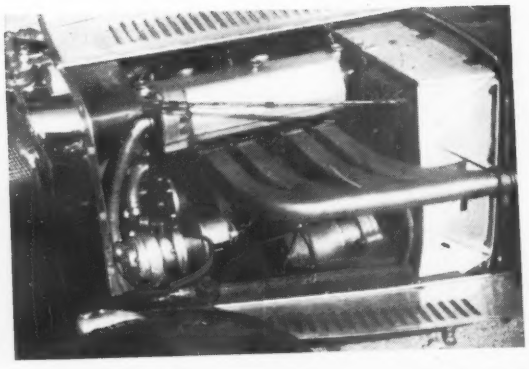
SCI Vintage Test

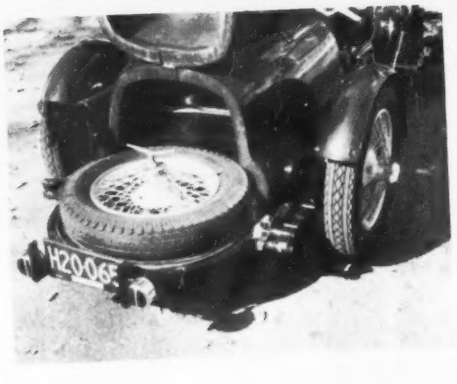
ASTON MARTIN ULSTER

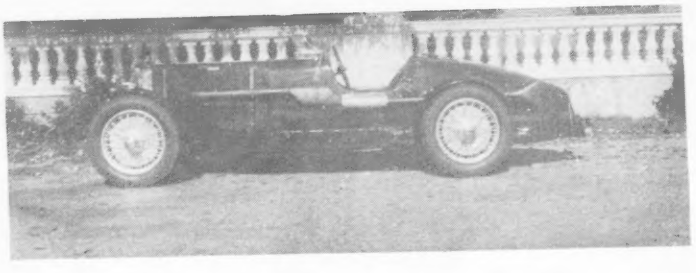












▶ In recent years, England's Aston-Martins have gained a high place on the list of the world's most desirable sports cars. Indeed, among enthusiasts their DB38 competition model must rate tops in appearance as well as handling and performance in its displacement class. Credit for this status must go to the present David Brown management, which acquired the great name in 1947. Aston's last great hour had been in 1935, when their Ulster model was the most coveted car in its class, if not in all England. In that year it set a record for 1½-liter cars at Le Mans that was to stand for fifteen years, and at the same time managed to be the epitome of the debonair, rakish fast road machine.

Sportsmen of the thirties craved Ulsters, and many men today still feel that it was one of the most exciting expressions of the automobile. Surprisingly, only one of these cars is known to have come to this country, but this lucky machine could not have a better home. Basil Scully has long maintained a spotless all-make repair shop in West Groton, Massachusetts, and is fully capable of restoring and keeping up the oddest or oldest of cars. He was on record as an Ulster fancier when FLR 707 appeared in the English journals, and it was imported soon thereafter.

This particular Aston was driven out of the works in the middle of 1934, and apparently saw action at Le Mans in 1935 in the hands of Trevelyn. The small forward extensions on the front fenders remain as evidence of the minimum dimensions required at that time. An inspection stamping on the engine also indicates that it may have been run in the Ulster Tourist Trophy of that year. At any rate, Scully had to do very little work on the car, apart from repainting and refurbishing of such details as the exhaust pipe shield. When an oil pump decided to devour itself he discovered that a considerable quantity of spares was on ready call in England, so very few bits have had to be made by hand.

I arrived in West Groton on a briskly cool and sunny Sunday, and was treated to a rare sight as the garage doors were opened on the green and silver Ulster, which must be as near original condition as any comparable car in the world. After proper priming Scully brought the four-cylinder engine to life, and set it at medium revs while it warmed up its 13 quarts of oil. Unusually for a production sports car, this Bertelli-designed Aston has dry sump lubrication, with the oil reserve tank being placed between the front frame dumb-irons. The scavenging and pressure oil pumps are driven in tandem by a helical steel timing gear from the nose of the crankshaft, which runs in three large main bearings. This lubrication system eliminates the need for any but a very shallow engine sump, and contributes to the low engine and hood height of the Ulster.

An additional steel gear drives the Scintilla magneto and the water pump, which in a very modern manner circulates coolant through the head only, while an ordinary thermo-siphon system cools the block. From these gears a Welter-spring-tensioned chain drives the single overhead camshaft. The valves are in-line, but inclined to provide wedge-shaped combustion chambers, and are driven through long eccentrically-pivoted fingers. Twin carburation is by SU as are the electric fuel pumps, one of which draws from the main and the other from the reserve of the 18-gallon fuel tank. Exhaust departs through a widely radiused manifold and the very effective Brooklands silencer.

A very deep crankcase surrounds the fully machined but not counterweighted crankshaft, just forward of which the generator is driven through a flexible coupling. This plus the starter, fuse box, etc. are of Rotax manufacture, which Scully compares with Bosch for quality. Spark plugs are three-point Lodge.

With a bore and stroke of 69 by 99 millimeters, 1488 cubic centimeters are displaced, and under a compression ratio of 9.7 to 1 these produce 78 brake horsepower at 5200 revolutions-per-minute. This output gives a very healthy performance with a wet car weight of 2275 pounds, and it can be adopted to the situation with the aid of throttle and spark advance controls at the steering wheel hub. The spark is generally run below full advance except when in a real hurry.

Instantaneous response with no lost motion is obtained from the throttle pedal, which is placed between the metal-faced clutch and brake pedals. The exhaust has a deep rumbling note, altering to an authoritative roar when action is called for. Clutch action is short and very smooth, the latter being a blessing with the very high gear ratios provided. The successive speeds in gears with the 4.25 rear end ratio are 40, 60, 80 and 100 miles per hour, and that first thus calls for some adroitness on a fast getaway.

Speeds in the unit-mounted gearbox are selected with a short round-knobbed lever operating in a compact machined gate. The pattern is "backwards" in that it progresses from right to left, and a latch-out for the reverse channel on the right is handy for competition. There is of course no synchromesh, but gear engagement is clean and sharp; rapid up and down changes being facilitated by the very close ratios and rapid throttle response. Indeed, Scully dispenses with the clutch entirely for much of his boxwork. In the vintage tradition, the transmission emits a variety of very mechanical growls and whines, and an open drive shaft rotates the ENV spiral bevel rear axle, which has a distinctive howl of its own. These are not unpleasant and fully in accord with the raw and gutty nature of the Ulster.

While the engine is advanced and unusual in many ways, the chassis in general is a study in essential simplicity. There have long been arguments over the relative merits of the vintage and modern suspension systems, and this Aston very clearly betrays its upbringing on the smooth and twisty roads of England. The vintage technique usually employs stiff semi-elliptic springs at all four corners, supporting the car on solid axles. Geometrical limitations prevent the use of long wheel travel with this type of layout, and there is thus not enough latitude to compensate for height differences between, say, the left front and right rear wheels. To provide this latitude, and thereby try to keep more wheels on the ground at a given time, the designers deliberately provide the frame itself with a degree of flexibility. This is a help, but unfortunately it is much easier to install a shock absorber between the frame and wheel than it is between two corners of the frame, and frame oscillations usually have to be damped out by the bodywork and the passengers.

As a result, very few vintage machines approached the hackneyed "rock solid" stiffness, especially in frame torsion, and for very good reasons. FLR 707, as you may have gathered, is no exception, and has semi-elliptic leaf springs all around. These are unusual, though, in that they have several shorter supplementary leaves above as well as below the main leaf, which may improve rebound control. This is also attempted by Hartford-type friction shock absorbers at each wheel. No torque arms, Panhard rods or brake reaction cables are resorted to, and the frame simply angles up over the front axle and sweeps below the rear shaft housings in the still-popular underslung manner.

A fore-and-aft drag link transmits force from the right-hand-mounted cam and roller steering box to the beautifully curved and finished steering arms. Lionel Martin's original goal for his namesake was to approach the Bugatti on roadworthiness, and this layout looks perhaps more "Molsheim" than any other part of the car.

The theme of simplicity is carried through by the brakes, which are mechanical without any compensating or balancing mechanism whatsoever. Each wheel must be adjusted to suit, which is made easy by very handy wingnuts. Steel drums 15-inches in diameter are carried inside Rudge wire wheels. The system seems to work, for though they demand substantial pedal pressure the brakes bring the Ulster up smoothly and without pull. Pressure of 25 psi is usually carried in the 5.25x18 tires.

Seating in this Aston must surely be the arch type of the bucket arrangement, as I very nearly had to shoehorn my way behind the wheel. Once in, the snugness is reassuring, and all the controls seem to fall naturally into place. The gear lever is a finger's reach from the smooth, thick rim of the big steering wheel, and the right arm falls automatically *outside* the car. In fact, when the rudimentary top is up if anything gets wet it is the right elbow, and Scully wears a leather jacket on trips for a very practical reason. The drilled handbrake lever is outside the bodywork on the right, as is a supplementary horn button. Instrumentation has been slightly altered from standard, with

(Continued on page 76)

MAKING A LITTLE PACKAGE GO A LONG WAY

by Hal Hennesey

You can, with a little carpentry and imagination, do plenty to increase the enjoyment and utility of your imported station wagon — especially on long trips.

Depending upon the degree of finish desired almost any simple woodworking tools can be used to convert the inside of

▶Once there was a man who bought an imported station wagon because it was a thousand dollars cheaper than any equivalent Detroit job and his wife thought it was simply adorable. They both liked it a lot. But then one day they decided to drive from their home in Albuquerque to a little summer place on Baffin Island, above the Arctic Circle. They would drive continuously, sleeping alternately. What fun they would have!

But they soon discovered that the station wagon measured only 80 cubic feet, whereas they required 120 cubic feet of living and cargo space. So the man spent $1050 and two weeks in converting his little foreign station wagon into something that resembled a Michigan Mishmash. He loaded and primed the vehicle and with a song in their hearts the couple headed for Hudson Bay.

They never made it. The rear end of the overloaded little wagon went *"Kersh-sh-chunkggg!"* just as they reached Milwaukee and by the time they had it repaired they'd used up all their vacation time and money. So the next year they traded the European station wagon in for a Flint Forchevac with a 140-inch wheel base, and not long afterward the man had a nervous breakdown trying to pay for it. "And, anyway," he said as they strapped him up, "—it was too damn big!"

The moral of this brilliant little satire: *Learn the limitations of your car before you buy it—and stay within those limitations.* (This applies to the limitations of your pocketbook, too!)

However, if you have chosen one of the above-mentioned "little wagons" as a sec-

a small wagon for long trips. Available space will dictate just how and where to install div isions.

ond car, don't hesitate to take it to Baffin Island, Panama or anywhere else simply because you think it too small or too delicate. I just drove one to Alaska and back to New York in the wintertime—with 800 pounds of gear and men inside. Not only that, there was still room for one man to sleep comfortably while the other drove. This was accomplished by means of a roof luggage rack and a little interior ingenuity.

The materials used in this job cost exactly $2.50; the time, four hours. The result: A more compact stowage arrangement, an increased safety factor, and a huge saving in inconvenience. Since the carpentry job is a matter of individual taste plus a dependence on the type of vehicle involved, I haven't given any set specifications. However, most arrangements will be variations of the one shown here, since it's the easiest to put up and tear out, and much can be done with it.

In each case, use screws and bolts for all fastenings and joints. Use wing nuts whenever possible, for easy dismantling. The main object, of course, is to supply a sort of "crib" affair, with partitions, or compartments, for the luggage—separated from the sleeping half of the wagon. The safety factor comes in up front, where you install a bulkhead or some method of partitioning the rear from driver-passenger cockpit. In a crash, statistics show that many a life and broken bone could be saved if heavy objects in the rear of the vehicle were prevented from shooting forward like bullets into the bodies and heads of the passengers. It's tough enough being impaled on a steering column without being speared from behind by an inertia-propelled rifle or pogo stick.

Also, the sleeper, on his air mattress, will be spared the burden of having heavy objects drop on him when rounding a curve, provided said objects are incarcerated in their own crib-like half of the wagon.

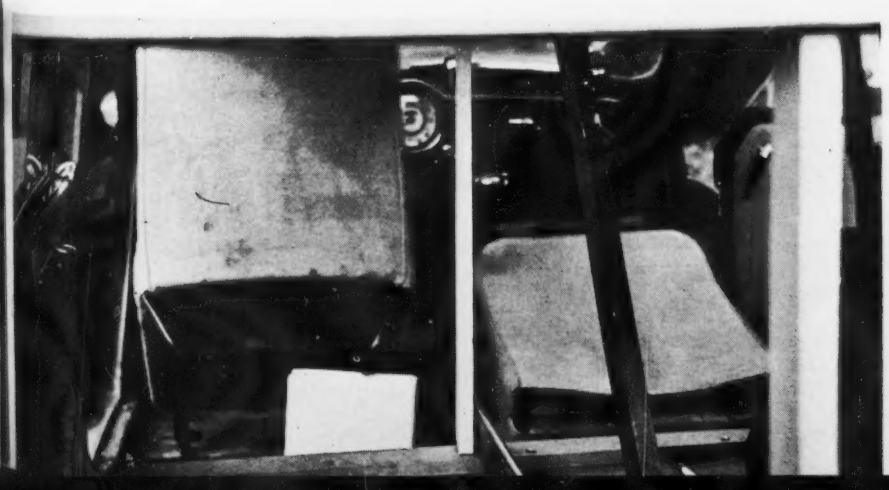
In doctoring up my Morris Minor, I utilized the upper eight inches of curved roof space — which otherwise would be wasted — in forming an upper compartment for rifles, fishing rods, bows, arrows and other long, loose implements. These things have a habit of cluttering up a station wagon or luggage compartment, and of getting broken or lost. Kept in their own little cell, they are eminently get-attable and safe.

One word about luggage on the roof: Put bulky but *light* objects up there, if you can manage it that way. These light cars are affected by wind to a greater degree than their two-ton American counterparts. The more weight you have in a top-heavy position, the more sway you'll have. This can be uncomfortable and, on an icy road, dangerous.

The Morris Minor Traveler, I should say, is probably the easiest of the foreign wagons to work with, due to plenty of woodwork inside, and a convenient arrangement thereof. It lends itself to such puttering. But each of the little cars is quite workable—a little design work will go a long way toward greater comfort, convenience and safety on a long journey.

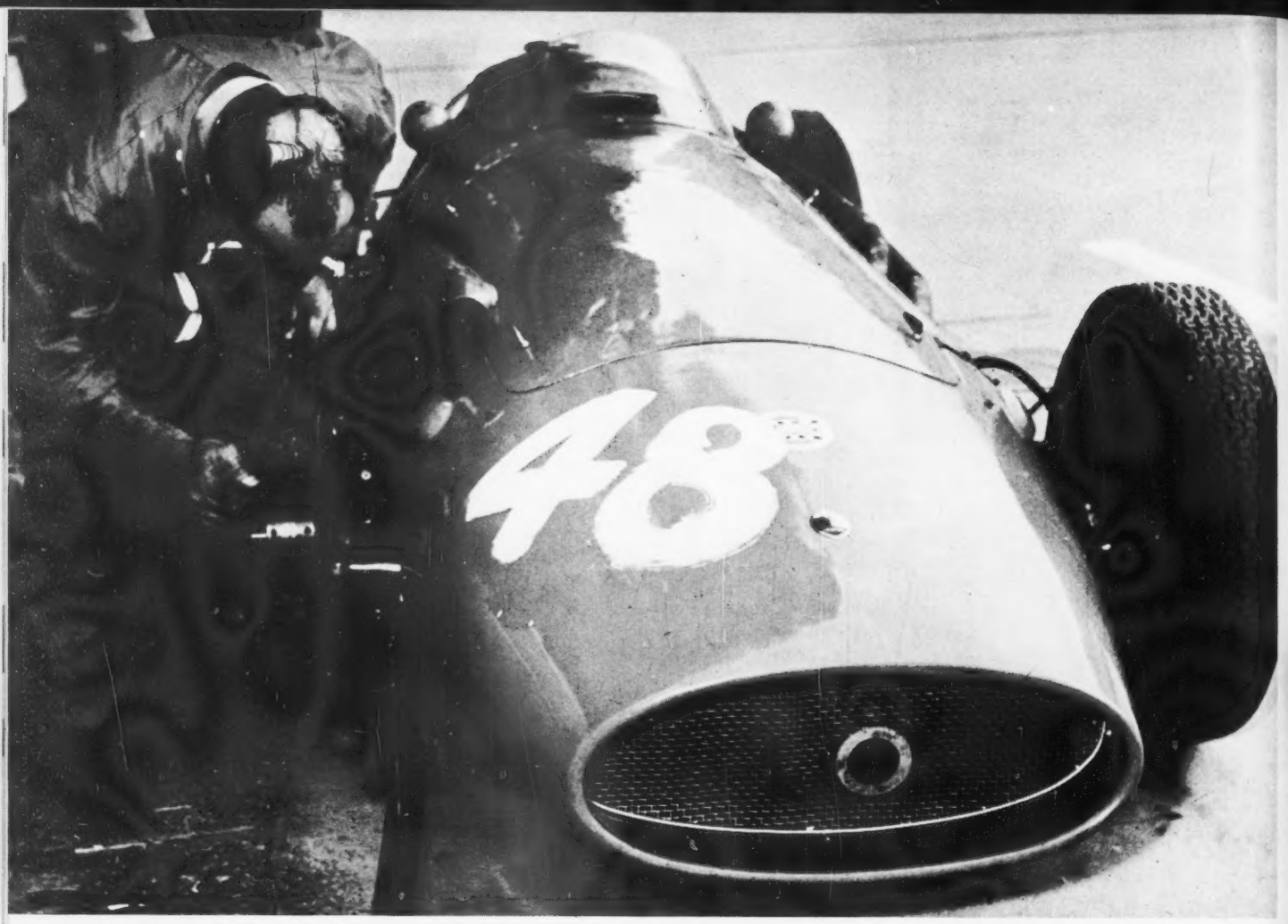
In fact, $2.50 worth of materials and four hours of your time may mean the difference between staying and going! So make the small investment—and go, man go!

A strong bulkhead between cargo space and driving compartment is a must.



An air mattress (far left) plus a long day's drive makes for good sleeping.

Framework for crib side (left) was spiked directly to the cargo deck in the Morris.



RACING BRAKES: The faster they go the harder they stop

Part I: Drum Mechanisms, Servos and Linings

by Karl Ludvigsen

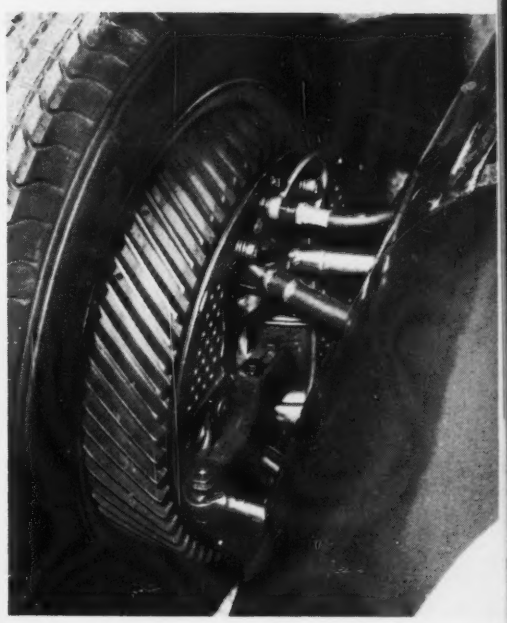
►"It could have been hotter," Phil thought, "and we could have had yesterday's fog, but it still isn't going to be very darned easy." On any day the job of playing hound to Stirling Moss' hare is as challenging as an assignment could come, but today — the Moroccan G.P., 1958 — Moss would scamper as no hare ever had in a last-chance scramble to snatch the World Championship away from Mike Hawthorn. Backing Mike all the way, Enzo Ferrari showed his new-found confidence in America's top road racing driver by sending Phil Hill out to harass Stirling into overextending his Vanwall on this near-120 mph track.

Moss was first away at the start but Phil in his light-framed drum-braked Dino was hanging on as if from a tow rope. He developed an attack plan during the hectic first lap and proceeded to try it out at the end of the second. "If I come out of the twisty back section at a good rate I have enough power to get even with Moss down the straight in front of the stands," he mulled. "Then we have to brake right down for the hard right just past the pits. Now I know Moss' disc brakes are a lot more durable than mine, taken over the whole race distance, but everything I've ever learned about brakes tells me I should still be able to hold or even take him on just one *maximum*-effort slowdown. I've got the new bimetal drums, and I've only used 'em moderately hard three times today. Let's check this theory out!"

The two cars came streaking neck-and-neck past the pits, Moss in the right or "inside" slot. Stirling applied the binders hard and late and cut into his line for the corner, while — "Damn!" — Phil was on the escape road on his way to Ain Diab. While he wrestled the Ferrari back into fourth place and eventually into third, Phil had a few moments to consider, "Well, I certainly thought that would work, but I was pretty obviously wrong. Now I honestly don't know *what* to think!"

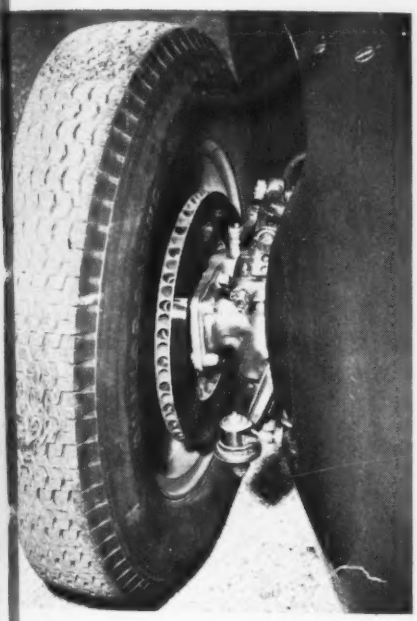
An outspoken advocate of disc brakes, Moss knows well what they can do and probably wasn't startled by the turn of events. Yet Phil's attitude was completely reasonable in the light of current informed opinion on brake performance. The 1958 Grand Prix season has, in total, seen the demise of a lot of public and private theories on racing braking and, unusually for this day and age, races have been won and lost on the issue of stopping power alone. Name one? The German Grand Prix. Finally in 1958 the racing world was swept by a sensation that might be equalled elsewhere if, for example, Pablo Casals took up the guitar and signed on to accompany Conway Twitty: Enzo Ferrari started using disc brakes, and English ones at that.

With Vanwall, BRM, Cooper and Lotus already using discs, and with Buell's Maseratis being measured for same, the good old drum and shoe may be exiled for good in 1959. Must this be so? Are disc brakes really better, or are there extenuating circumstances for the poor showing of drums during last season? It's time to review events in this fast-changing field and to draw those conclusions that seem to be indicated. In this first installment I'll be taking up the design and application of the shoes of drum brakes, with some notes

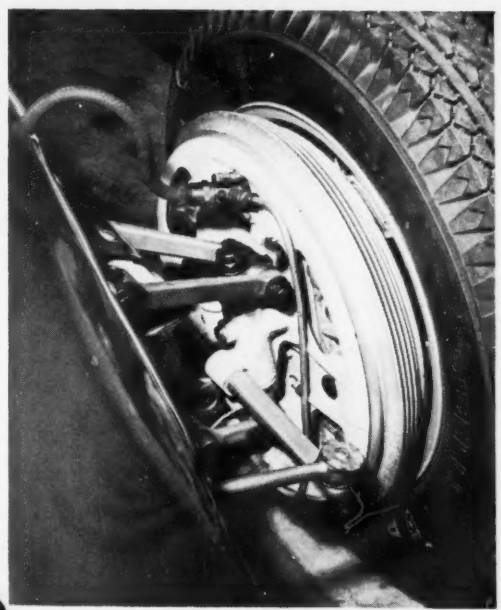


First D 50 Lancia brake (right) had four leading shoes. Four hex nuts provided adjustment. Drum is cast iron, finely finned. The question of drum vs. disc brakes has not been completely answered, although the discs (below) on the Vanwall have proved winners.

The honor of drum brakes was upheld during last season mainly by this Ferrari machinery. Phil Hill's Morocco car used the same center-pivot mechanism with a bimetal instead of cast iron drum surface, with the same finning layout.



Post-war Mercedes Grand Prix cars made use of neatly done pressed backing plate. Leading edge of each shoe had extra hard lining.



Lampredi-designed center-pivot shoes (above) were first used on 4½-liter Ferraris, then on Formula II cars as in this installation. Pivot position is marked by dark bolt head.

on servos and brake linings. The second part will deal with the material, structure and cooling of brake drums, while the last two sections will review all aspects of disc brakes.

Even today some journals find it necessary to add the word "hydraulic" to descriptions of racing car brakes, though no car of significance has used anything else for ten years. Actually it's most surprising that as late as 1949 the Lago-Talbots were actuating their Bendix brakes mechanically, a holdover that reflects the basic conservatism of the racing car designer. Much more vision was shown in 1920 when the Wagner Corporation and the Duesenberg brothers collaborated on the first hydraulic racing brake system. Actual application of the shoes was by a mechanical linkage provoked into action by a separate wheel cylinder mounted outside the backing plate. At the front these cylinders were affixed atop the kingpins, where they received their glycerine/water fluid through hollow kingpins and lines inside the tubular front axle. Very close machining obviated the use of rubber seals in the wheel and master cylinders.

Duesenberg's great run in the 1921 French G.P., aided by potent braking, left a ringing echo in Molsheim. Bugatti tried a very similar system on his 1922 cars, but abandoned it at once as it didn't work well at all. Hydraulics languished until Maserati took up the cause again in the early Thirties, followed in 1934 by Mercedes and Auto-Union who needed the versatility of hydraulics for their new independent suspension systems. In the same year Mercedes introduced the now-common

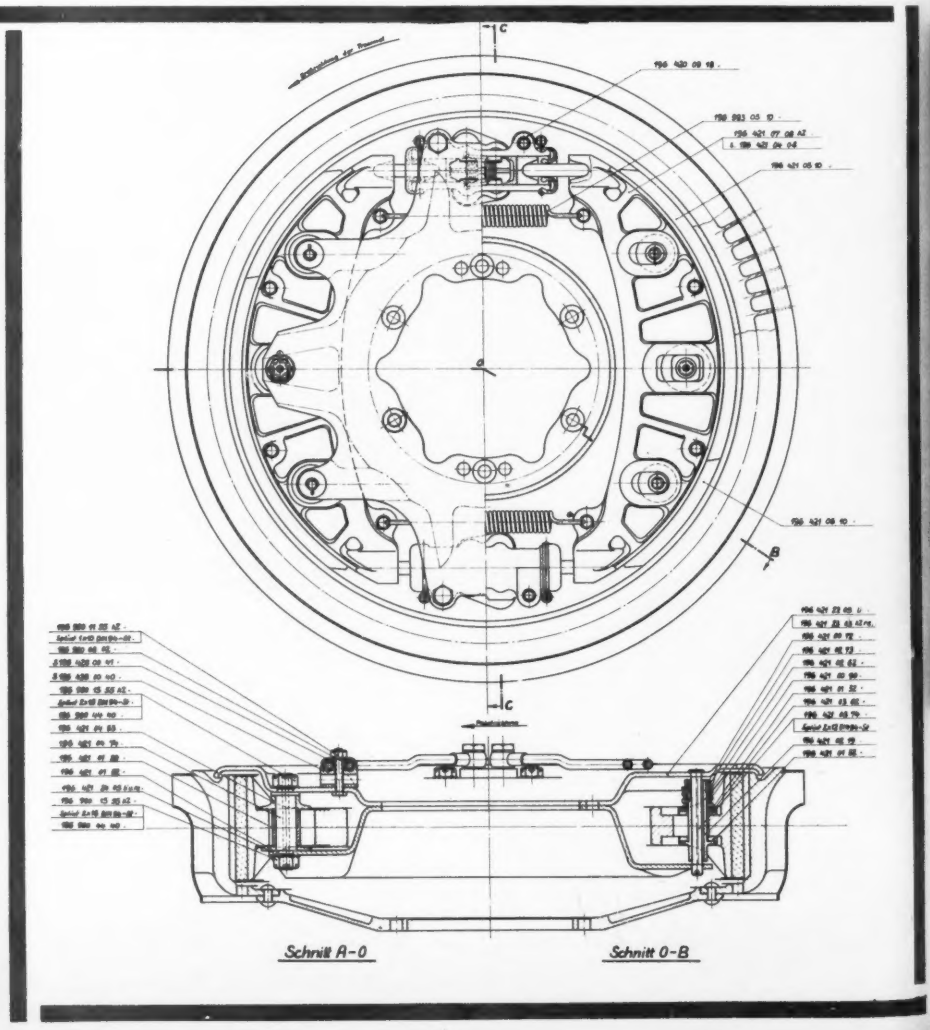
double master cylinder arrangement which proportions front/rear braking effort by placing the front and rear systems under different pressures, according to the setting of a balance bar linked to the brake pedal. In most modern cars the reserve supply of brake fluid is also piped from a canister separate from the master cylinder body, so that it may be cooler and more accessible.

Since internal-expanding drum brakes were invented, the classic shoe arrangement has been what I will call *conventional:* two shoes, with one *leading* and one *trailing*. Briefly, a shoe is leading if the motion of the drum surface is from the movable tip of the shoe toward the shoe pivot. Surface movement with a trailing shoe is away from the pivot. Because of the forces involved, a leading shoe has a self-wrapping action which makes use of the rotation of the drum to press its lining harder against the surface. The trailing shoe, on the other hand, must work against this rotation. In the case of the leading shoe, the self-wrapping effect obtained is proportional to the coefficient of friction between lining and drum. If, then, heat or some similar factors cause the friction coefficient to drop or "fade", the self-wrapping or *servo* effect will fall off too, causing a double loss in the effectiveness of the leading shoe. No such rapid fading plagues the trailing shoe, which however has no servo effect to begin with. The overall effect with a conventional type of brake is reasonably consistent stopping performance, at the expense of very different conditions on the two shoes. The leading shoe will work much harder, often being fitted with a more rugged lining than the trailing shoe, which in turn will be applied to the drum by a larger wheel cylinder.

These mechanical unbalances will be tolerated by the designer who wants consistent, low-fade braking with the simplest possible layout. Always practical above all, the Maserati brothers probably got the most out of conventional systems in racing. Their very fast prewar R1, 8CTF and 8CL G.P. cars used huge (16-inch) conventional brakes of a design which was carried over to the 4CL and 4CLT postwar cars, and further to the Orsi-built A6GCS sports and A6GCM Formula II Maseratis of 1952 and 1953. They all use very stiff shoes cast of light alloy to a simple design, and have all featured adjusting cams acting against the centers of the shoes rather than against the tips, as is more usual. The brothers took their pet brakes along when they started building Oscas, which must be the only prominent competition cars still using conventional mechanisms front and rear. Such mechanisms were also used on Grand Prix Ferraris up to mid-1951, and on all Gordinis until "The Sorcerer" started using Messier discs.

Credited with so many firsts in brake design, the Lockheed Company thought of using two high-servo leading shoes in one brake assembly to get maximum stopping force out of the available pedal pressure. Requiring two separate cylinders for each wheel, this was naturally named the *two-leading-shoe* or 2LS brake. It has double the self-wrapping effect of the conventional layout, but equally has twice the sensitivity to the friction coefficient. It's a very powerful but not outstandingly stable brake, which made its major racing debut on the Auto-Union cars and was later picked up by Mercedes for the 1937 W125 and later Grand Prix cars. These brakes were built with the aid of Lockheed's German licensee, Alfred Teves. 2LS was on hand in time to be incorporated in the 1937 Alfa Romeo "Alfetta", the forerunner of the great 158 and 159 Alfas, and was also fitted by Lockheed to the D-Type and E-Type ERA's.

In addition to Alfa, 2LS design has been used since the last war by Connaught, Cooper and ERA, all from the land of its origin. But its most consistent recent booster has been the Orsi Maserati Company. Introduced in January, 1954, the now-classic 250F Maser had 2LS front and rear, setting a pattern for every subsequent racing Maserati. The brake shoes of these late Masers have all been cast in an intricate pierced-truss pattern, varying in heftiness from the lacy filigreed look of the Formula car shoes to the rugged waffle-like structure seen on the huge 450S binders. Embracing the center of every shoe is a fork-like guide which prevents any lateral movement. To overcome the unstable character of the 2LS layout Maserati use very hard linings, with the result that very high pedal pressures are required but action is completely progressive. Its self-wrapping character makes the 2LS brake very susceptible to locking up; another drawback that's mitigated by hard linings. They still have to be "warmed up" before they'll work smoothly, but even when warm, Maser front brakes do tend to lock up more frequently than the competition's. Fangio and Shelby had especial difficulty



Left front inboard brake of 300 SLR Mercedes. Back plate is cut away to show center pivot and adjuster in right half of upper view. Right half of lower section shows the adjuster, while the left half shows the center pivot with its firm lateral location.

with occasional locking of the very large front binders fitted to the 1958 "Piccolo" G.P. cars.

A further extension of the 2LS idea is the *multiple-shoe* brake: any unit with three or more shoes per wheel. The shoes might be leading or trailing or any combination but are usually leading, since the shorter arc of each shoe offers a reduction in servo effect and thus an improvement in stability, compared to the standard 2LS rig. The use of several smaller shoes can allow additional lining area and always ensures that the existing lining is making maximum contact with the drum. This will be clear if it's realized that the best possible contact would result from an infinite number of tiny shoes; the closer we can get to this, the better use we can make of the lining area we have. Mechanically, however, it *does* get complex.

The first MG had four-shoe brakes, but wasn't renowned for its stoppability. Before settling on the 2LS layout the Auto-Union boffins tried out four-leading-shoe and three-leading-shoe mechanisms too. For the V16 BRM of 1949 Girling engineers developed a neat three-leading-shoe brake with three very small separate wheel cylinders applying slim alloy shoes with a sturdy "U"-section which allowed broad-based pivots and a firm backing for the lining surface. These brakes worked very well indeed. They were in fact one of the least troublesome features of a cantankerous motorcar.

Drawing from their Auto-Union experience, the Porsche organization specified four-leading-shoe brakes for their 1948 Grand Prix car project for Cisitalia. Two compound cylinders at each wheel applied the shoes through a system of rods and rockers, while each shoe managed to contact 75 degrees of the drum surface — a very high percentage of the maximum possible contact of 90 degrees. On the few occasions the Porsche 360 was driven, the brakes received high praise. A similar system was found on the original D50 Lancia of 1954 and early '55. Each double-ended wheel cylinder on this car actuated two of the four shoes, through a straight pushrod at one end and a short rod and a stubby rocker at the other. A very deeply-dished backing plate allowed the cylinders to be mounted out in the cooling breezes. By all standards — including direct comparison against the 250F Maserati — these exceedingly wide brakes seemed to work and work well, like most multiple-shoe installations, but they were supplanted in April of '55 by a new brand of two-shoe brake.

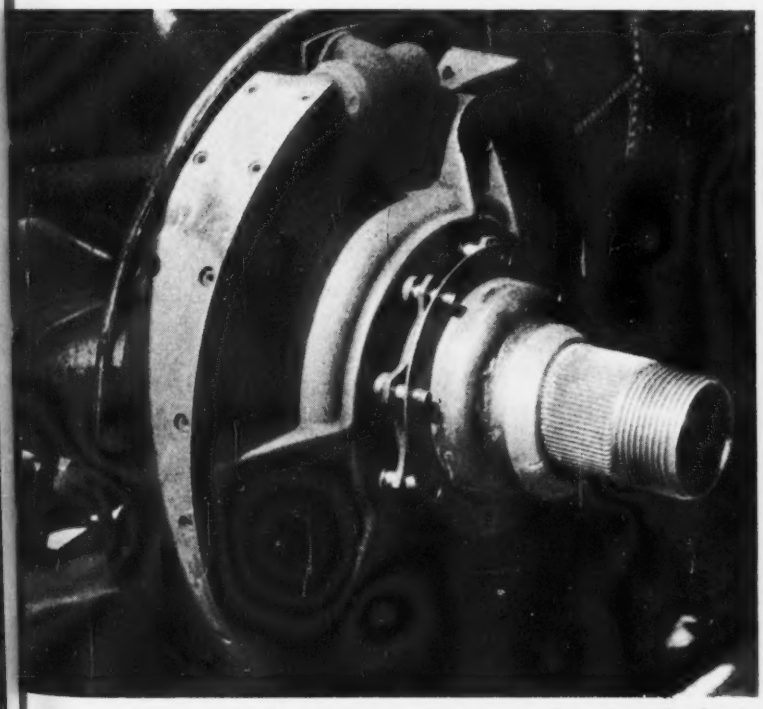
Commendatore Ferrari has employed several renowned racing car designers, among them Colombo, Jano and Bellentani, but none were more creative and prolific than Aurelio Lampredi. When the latter got the big 4½ liter G.P. car ticking well early in the '51 season, he found that he needed somewhat better brakes than the conventional mechanisms he had inherited from his predecessor Colombo. By all appearances he deserves full credit for an original design of brake which first appeared on the front wheels of the 4½ liter car, being used on all fours by the end of 1951 and on all Ferraris since — until the recent Maranello Millennium, that is! I'll call it the *center-pivot* brake, a literal description of one of its most prominent features.

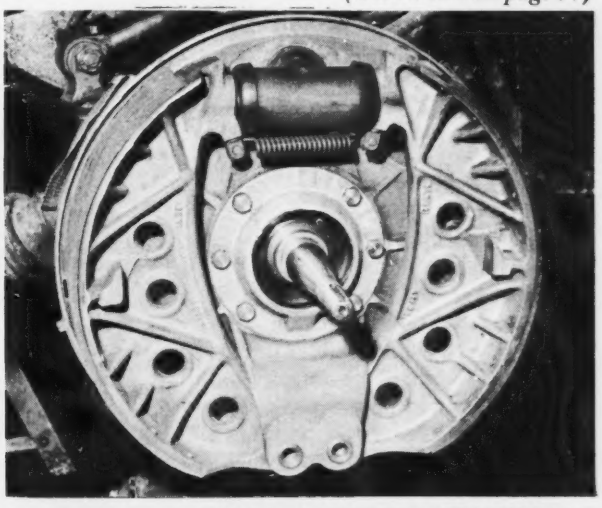
The two shoes of a center-pivot brake are actuated by *two* double-ended wheel cylinders, placed symmetrically so that both ends of both shoes are pressed outward simultaneously. Superficial examination by some critics has led to the assumption that these are "2LS brakes which will work either forward or backward", but they've missed the important point: At the center of each shoe is a slot carrying a square or round block which is firmly pinned to the backing plate. The actual pivot or reaction point is thus at the *center* of the shoe, with the happy result that each shoe has a half-leading, half-trailing characteristic with no extremes of either, giving very consistent servo-free braking and a satisfyingly balanced construction.

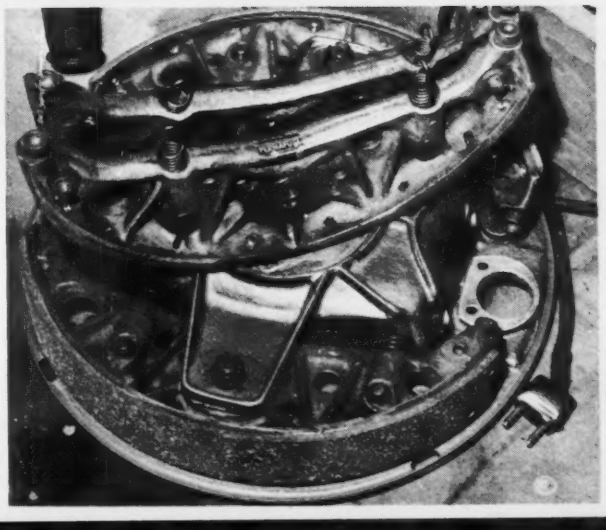
Lampredi's pioneering application uses heavily-webbed shoes with two pull-off springs each and a conventional adjusting cam at each end — four cams in all. It was first built in a 360 mm diameter for the 4½ liter Formula cars, some Formula II Ferraris and for the Monza and larger sports cars. Current Gran Turismo Ferraris retain the 360 mm size. A smaller 350 mm brake was developed for most Formula II cars, the Mondial, and early 2½ liter Formula cars, while a 330 mm size was also on hand for rear wheels of sports cars. etc.

When Lancia gave up their four-shoe brake it was only to adopt the center-pivot system, along lines similar to Ferrari's. Only two double-acting pull-off springs were used, and the adjusting cams were

(Continued on page 74)







Maserati 2LS brakes (above) are the most modern drum brakes to be found in racing. They feature beautifully cast webbed shoes and backing plates. The pictured example is mounted on the left rear wheel of the 250 F G. P. car. Still another example of Maserati brakes (above right) found on the front wheel of an A6GCS two-liter sports car. Abutments for adjusting cams can be seen at the centers of the symmetrical shoes, which are of exceptional depth. Center-pivot shoes of 1958 Dino Ferrari (right) follow Lampredi lines exactly, have conventional cam adjustment with feeler gauge slots in back plate. Removed shoes display round central pivot bushing used by Ferrari, instead of square bushing favored by Mercedes. No wheel cylinders are fitted here.

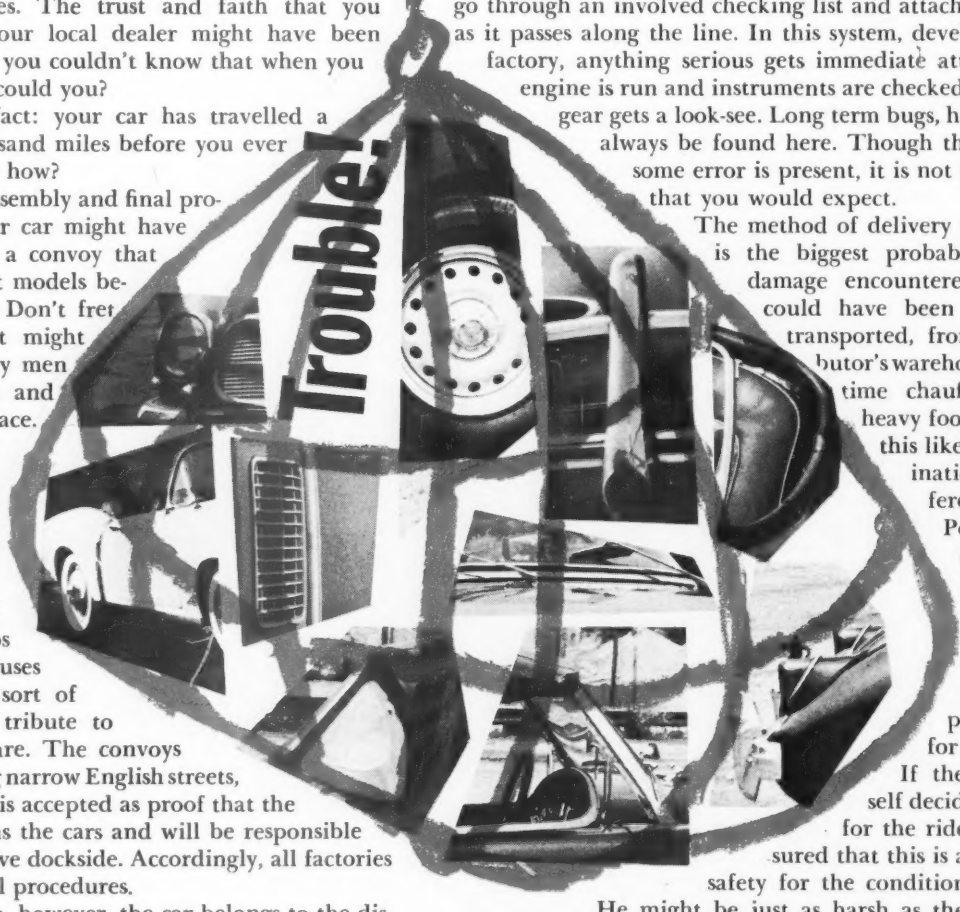
What did you buy?

by Stan Litz

►When your interest in fine machinery has carried you to the point of no return, ownership of an imported car, be prepared to accept one of two alternatives. It can be the beginning of a long and wonderful relationship between yourself and "the machine" or it can mark the start of a series of frustrating troubles. Though you may have felt like a Knight of the Road when you left your dealer's showroom, a few hours beside a stalled car on a lonely highway can make you the fanatic that Detroit dreams about.

Actually, the dealer is not always the responsible party when you have troubles with your new charge, nor is the factory. While you wait for that service truck to appear, you might also wonder if you, the trusting owner, aren't liable for your own headaches. The trust and faith that you demonstrated toward your local dealer might have been misplaced, but certainly you couldn't know that when you signed the order . . . or could you?

Keep in mind one fact: your car has travelled a minimum of three thousand miles before you ever saw it. The question is, how?



At the factory, after assembly and final production inspection, your car might have been one of several in a convoy that was composed of export models being driven to the pier. Don't fret about the treatment it might have been given, factory men always travel in teams and maintain a very sedate pace. The lead car, and very many others in the group (if they are MGs) has a record that tells just how fast the car went, and shows a fairly accurate record of traffic conditions, stops and starts, etc. BMC refuses to ship a car in any sort of doubtful condition, a tribute to their inspection and care. The convoys are a familiar sight along narrow English streets, and the measured pace is accepted as proof that the factory still legally owns the cars and will be responsible for them until they arrive dockside. Accordingly, all factories maintain similar careful procedures.

Once aboard the ship, however, the car belongs to the distributor. It is loaded under the careful eyes of veterans in automobile shipment as well as a factory representative. The ocean crossing can be considered pretty much uneventful though minor rope burns are occasionally noted. What makes the economic life of a distributor hazardous is the unloading procedure. Without a representative or owner present, as any serviceman who purchases a car abroad can attest, longshoremen tend to rush things. In the hustle, fenders bend, easily. Cars that have been docile machinery up until this point get suddenly perverse and drop out of slings. In some cases, stevedores decide to play jockey with some very expensive mounts. One owner arrived pierside to find his Mercedes-Benz 300 SL convertible being used as a drag roadster by some enthusiastic dock men! He immediately filed a claim for damage to the car, and luckily was not alone when he saw the action.

Of late, distributors all claim to have a man at the pier when the cars arrive, and damage from rushed handling has diminished considerably. The volume of cars has increased to the extent that they no longer are novel to the longshoremen, several of whom are now owners.

Where then, do things go wrong? It is reasonable to assume that the distributor can answer the question with fairly clean hands. His organization processes the cars just as they leave the ship and puts them into shape for transport by truck or railroad. Your car, and a hundred others just like it, go through the disinterested hands of busy checkers who are pressed for time to maintain a taut delivery schedule. They go through an involved checking list and attach it to the car as it passes along the line. In this system, developed by the factory, anything serious gets immediate attention. The engine is run and instruments are checked, all running gear gets a look-see. Long term bugs, however, can't always be found here. Though the chance for some error is present, it is not to the extent that you would expect.

The method of delivery to the dealer is the biggest probable source of damage encountered. Your car could have been driven, not transported, from the distributor's warehouse by a part-time chauffeur with a heavy foot. Not only is this likely, but examination of the difference between Port of Entry (POE) price, and the price you pay on your bill of sale will show that you have paid up to $75 for this damage. If the dealer himself decides to go along for the ride, don't be assured that this is a guarantee of safety for the condition of your car. He might be just as harsh as the eager young driver following his tracks. One midwestern dealer admitted ignoring the break-in instructions and running the car at a speed where the "engine sounded happiest". Since he was a competition driver, happy engine sounds come high on the rpm dial to his ears. He was clocked doing 70 mph on the Pennsylvania turnpike, leading a covey of new cars. Another caravan was noted doing 60 on the freeways leading out of Washington, D.C. Since the lead car was a sports car, the small family sedans that comprised the rest of the group had to really rev up to stay with him.

Conversely, one young man drove for nineteen consecutive hours at slow and varied speeds rather than hurt the car he was driving in from the receiving area. On the back of that car was a sign; "Breaking it in. Enjoy Passing It While You Can".

to your car from dock to dealer?

The useless scuffing of piston rings that results from driving "too fast, too soon" is a direct penalty to the owner. If your dealer has to have your car driven in, do the driving yourself. You can save the transportation fee, and know that you have not abused the car. More than that, you'll have an accurate speedometer reading that tells you exactly how much mileage is truly on the car. The speedometer is not connected at the distributor's warehouse and the extra mileage with break-in oil in the crankcase can overdo the same job that you'll spend long week-ends doing properly, you think. The first step, then, before ordering your new car, is to find out how it is to be shipped, and making the arrangements beforehand. If it comes in by any interstate carrier, the dealer should be able to show you a bill of lading for the costs, if you want to get sticky about it.

The next thing, obtain a copy of the check-over list used by the dealer to process a new car. Getting a copy of this pre-delivery check sheet will simplify your own check list. One eastern dealer leaves it entirely up to his mechanics. Their answer to the query was, "If you're a mechanic, you know what to do!!" After watching one of the crew check a new Porsche through I was convinced that he was a mechanic. But I'll vouch only for *him*.

The days will pass very slowly while waiting for your new car to arrive. You might spend the time looking over the check list you've obtained and start making one of your own. Of the four lists collected, three of them mentioned checking the brake fluid level in the master cylinder, one omitted it entirely, none of them mentioned checking for hydraulic leaks if a low master cylinder was noted. You don't have to be a mechanic to do this job right, a little patience and common sense is all that is necessary. The easiest thing to remember is that it will take a little time, so begin by noting that you will not take delivery of your new car five minutes before the garage and showrooms close for the night.

Next on the list is a talk with the service manager. Use your best sales approach and get him to understand that you are trying to save him a needless service call when he needs everyone in the shop. Make your pick-up appointment with him, and be there on time. If he can lend you a copy of the owner's manual that will come with your car, borrow it then and there. If not, arriving a little early, and doing a little pre-requisite reading might not be a bad idea at all. You will find the foreign car manual far more technical and complete than its domestic counterpart. If something troubles you, ask for information.

Restrain yourself, now that the time has come, and start immediately. If you've bought a convertible, learn the proper way of erecting the top and side screens, and the stowing and folding procedures as well. If you have a sunroof, understand the mechanism completely. Part of the non-deductible expense of ownership is replacement cost of rain-soaked female finery resulting from glossing over these procedures. If you have a roadster, locate the trunk and hood release latches and pulls. Finding them at this time will prevent you from becoming the object of smirks from superior gas station attendants who are waiting to check the oil, or the spare tire. Now, and without delay, learn what type of hood and trunk releases you have and how to operate them properly. Show the operation to the men at your local service station. The sad VW owner who saw his trunk lid buckle under the misguided hands of a service station attendant will always be one of motordom's quiet tragedies. Three out of three VWs examined on a used car lot showed this type of damage.

While you are in the vicinity of the trunk, check your tool kit with the list in the manual. If you have a sporty type car, with wire wheels, check the quality of your wheel nut hammer, and use it vigorously on every wheel but one front one. We'll come back to that later. Loose wheels cause a "clacking" sound and the damage that is caused is done to both the splined hub and the wheel itself. There is no repair possible, and replacement is costly since both must be replaced.

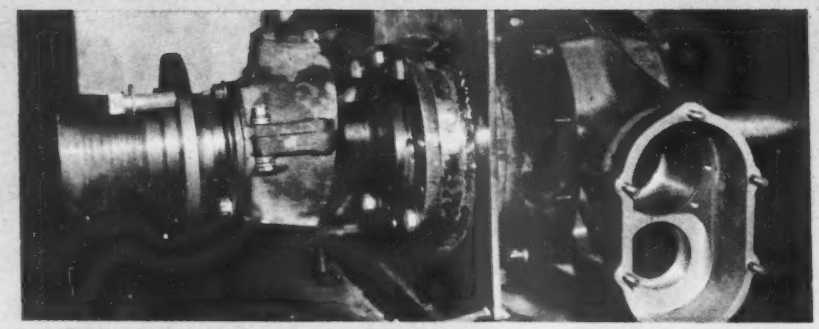
While in the trunk area, find your gas tank cap. It might have a trigger release that is contrary to expectations, so work it once or twice. Remove the spare tire so that you will know how it is done on dark rainy nights and leave it out of the niche temporarily. Time now to go up front and look for other things, but on the way notice the paintwork, and any damages from cables, ropes, etc. Look for chips along the trailing edges of the door and trunk too.

Up front, assuming you are not buying the rear-engined variety of fun, locate the oil dipstick and find out if you still have break-in oil in the crankcase. This lighter viscosity oil has a penetrating and lubricating function, and make sure you have the correct figure for your replacement mileage. If you have oil-damped dashpots on the carburetors, learn how to fill them to the proper level, and what grade oil to use. When conflicting information is given, follow the recommendations in your manual, unless factory literature recommends otherwise. Ignoring the manual is a good way to void the warranty. In your discussion of oil with the mechanic, find out if your car has a chromed set of piston rings. Some Porsches had this feature and the rings didn't seat for a long, long time. Oil consumption was initially high for a new car, and owners who didn't understand what they had (Oh, there were a *few!!*) were needlessly worried.

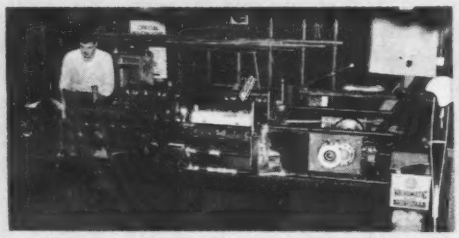
Since you will be driving in inclement weather, find out what the heat range is on the installed thermostat. (VW, Porsche and Franklin owners, please ignore.) Why not get the other heat range while you are able to get the proper one and know that it fits? Keep it in the car as a necessary spare part. If you have an anti-freeze in the car, how low is a safe temperature?

Still in the engine room, look around for loose connections in the fuel system. Gasoline dyes will be a big help to you here. They are less volatile than the fuel itself, and remain after it has evaporated. A small stained area around the carburetors is not cause for alarm, most of the cars have been tuned on the rich side to compensate for their newness and the stains might be nothing more than that factor. Needless and excessive stains on the engine should be investigated carefully. The area around the valve cover and side plates should be clean to the touch. Call any unexplained stains to the immediate attention of the mechanic or service manager.

Check your batteries, especially in the newer MG. They are beneath a panel in back of the seats and the location is not clearly defined in the manual. Because they are so awkward to get at, check them before leaving the engine compartment phase of your checklist. In the engine room the master cylinder is often found on the driver's side of the car. Check it for proper level, and if it low, keep it in mind. These two, often awkwardly located components of your car

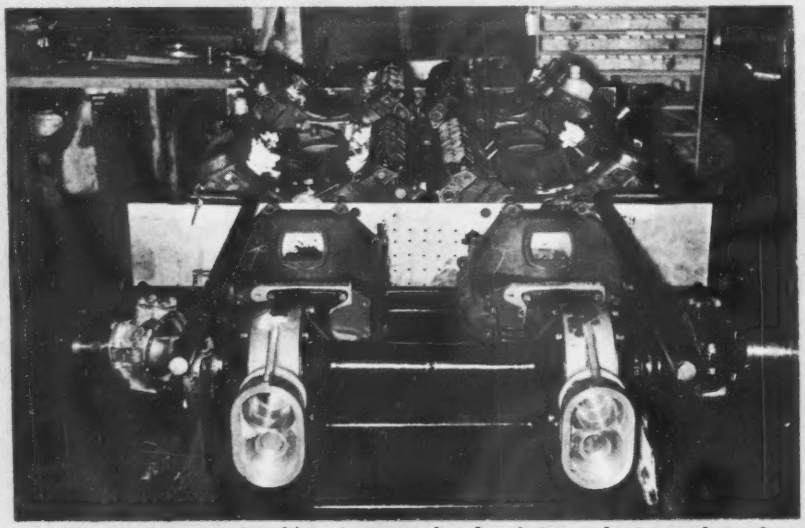


Power for the front wheels will go through two quick-change final drive assemblies and wheel overdrive units like this one clamped on chassis.

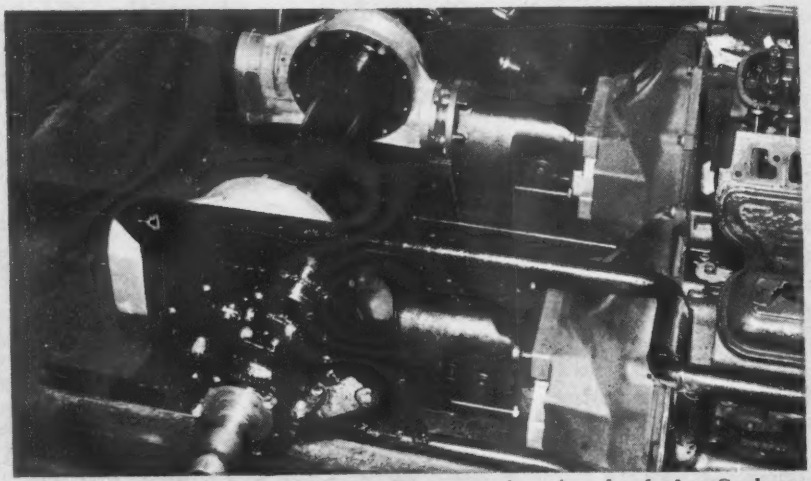


Builder-driver Mickey Thompson works on chassis placed on extra-strong steel welding table.

Mickey shows body-designer George Hill, right, one of the special elbows used in chassis.



Looking down at the chassis from the front shows how four V-8's can be packaged in a low, fairly narrow chassis.



Front end of chassis (above) with reversed engines hooked to Cyclone quick-change units. Cadillac transmissions are mated to Pontiac blocks with Cook adapters.

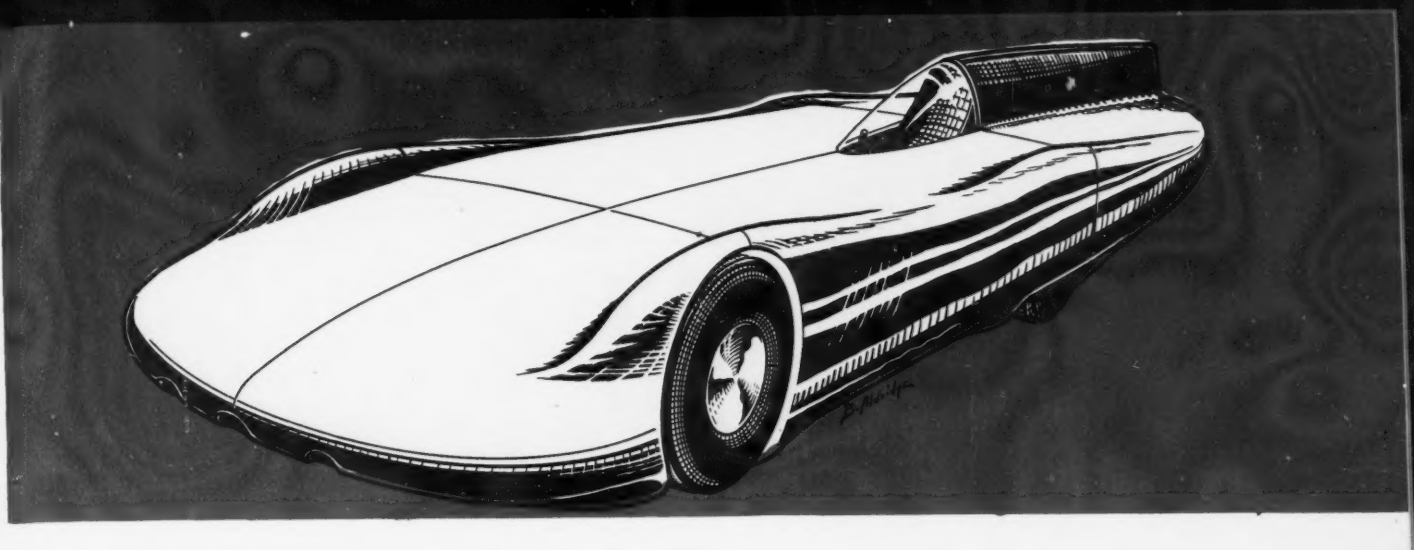
4 FOR 400

►There was something of terror in the air when Mickey Thompson tuned his engines in the warmup area at Bonneville in '58. The Salt seemed to shake violently and the sound was unlike that of any of the hundred-odd other hairy competition machines gathered for the annual, week-long exercise in high-performance prowess. You hear many strong engines there, with exhaust notes that are on the threshold of human tolerance. But Thompson's cannonading was the worst. The sound waves were almost visible, scarcely bearable. And this was when only one of his two massive Chrysler engines was running. When both were lighted, you just got out of the area. Anybody can tune for the top end. To get that shattering bark at the low end calls for above-average skill.

The vigor of those Jovian-voiced engines was reflected in the brutally efficient appearance of Thompson's machine. It was simply a slingshot dragster. Streamliner pilot and fast-car designer, George Hill, had created an aerodynamic envelope for the chassis. It was square as a brick except at nose, tail and edges. In these areas Hill had contoured its skin so skillfully that the black-primered beast slipped through the salt-laden air like an arrow at the astonishing speed of 294 mph. And it handled beautifully. This car was Thompson's penultimate effort. His next and final one was to shoot at the Land Speed Record.

Says Thompson, "All my knowing life I've wanted to be the fastest man on earth. Everything I've done has led to this goal and all I own is in the new car. If I get the record I think I'll be through with racing; I've had enough close calls to feel that my luck is on the ragged edge. Of course if they run the Mexican Road Race again—which it appears they may do—I'll be there. I'll have a car ready on a week's notice."

This is Mickey Thompson, whose youthful life has been devoted, quite successfully, to speed. He is an outstanding mechanic and builder of high performance machinery. He's 27 years old, has raced for years on the dry lakes, The Salt and at the drags. He has driven in the Carrera Panamericana and recently, in professional sports car contests. Ask anyone who's been around Mickey what he is like and you'll get a story of uncanny, compulsive,



An American Assault on the Land Speed Record

by Griff Borgeson

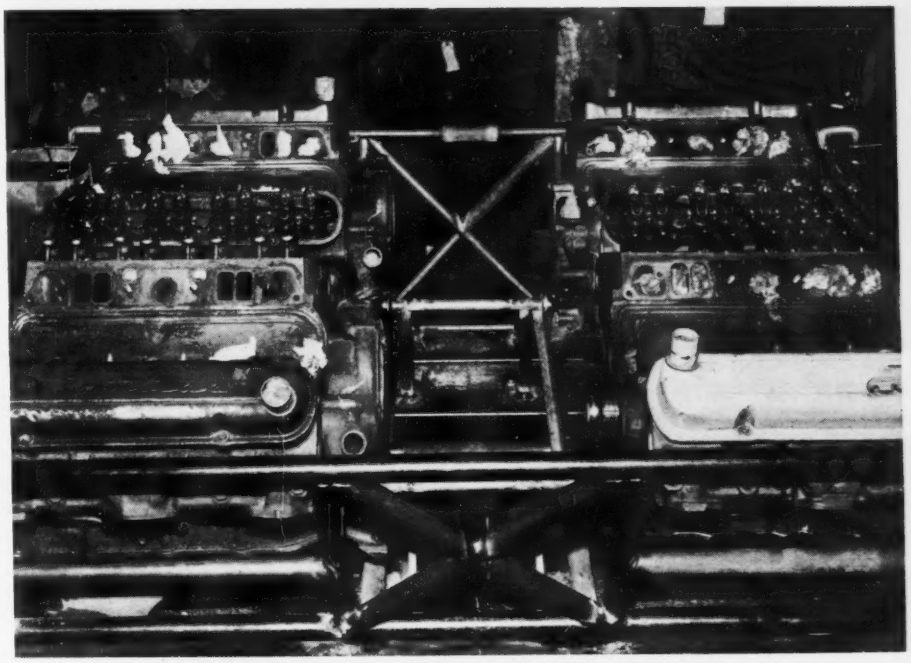
inexhaustible energy. He works like a man possessed. He always has, and thrives on it. But this drive is not diffused. It's always disciplined, always directed to a specific goal set by his restless and rich technical imagination.

His present objective is the World Land Speed Record established by England's John Cobb in 1947. In setting the 394.2 mph two-way record Cobb used the total length of the Bonneville Salt and it's been held by many experts that higher speeds are out of the question; that there isn't room for the essential acceleration and braking. It also has been argued that Cobb's Reid Railton-designed machine is not to be improved upon; that the body was as close as you could get to aerodynamic perfection and that its size was about as small as you could hope to build a container for the required power sources.

There are those who do not agree and who are doing something about it. Donald Campbell, in England, has a jet-engined LSR machine on the drawing board and so has the team of Ak Miller and Dr. Nathan Ostich, of Los Angeles. Chet Herbert, also of Los Angeles, has extremely exotic plans for an LSR machine but all of these are still in the planning stage where some of them have been for years.

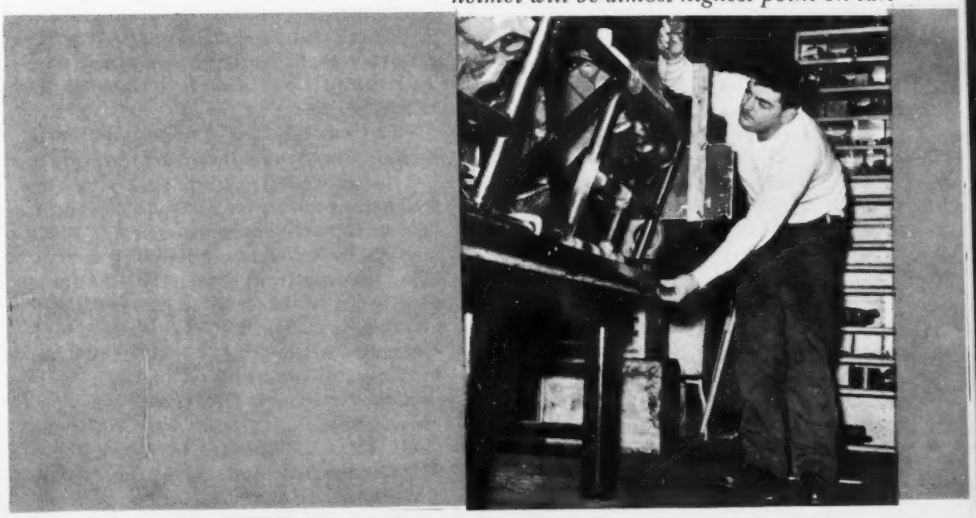
But for Thompson, to think is to act, and to act is to produce, with spectacular speed. His purpose in building the twin-engined dragster was to develop a test-machine for Bonneville. With a power output of about 800 hp he hoped to gain experience at speeds of about 280 mph. He went 294, confirmed the aerodynamic correctness and stability of the Hill-designed shell, found out what it is like to drive at such velocity. And he ascertained that, with less than one-third of Cobb's horsepower, he was able to get within 100 mph of the ultimate record. The dragster had served its experimental purpose and Thompson literally dove into the numerous problems that go with the design and construction of an LSR machine . . . and the procurement of its components.

Absolutely basic for such a vehicle are tires. First, there is no point in thinking of a new LSR car if there are no tires that will stand up to the required speed. Second, tires are fundamental in determining the dimensions, shape and gearing



Four Pontiac engines are bolted to a common jig to insure proper alignment while chassis framework is built around them. Bodywork will just clear engines.

Mickey measures room left for pilot. His helmet will be almost highest point on car.



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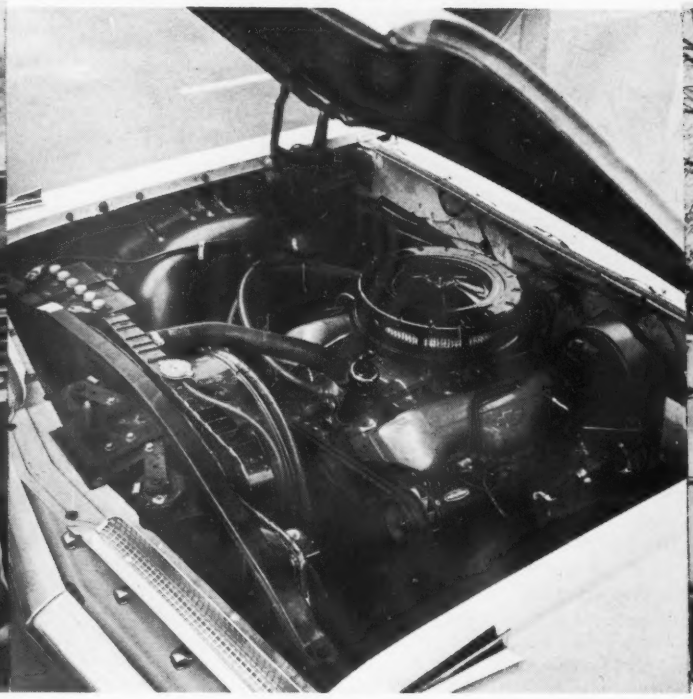
SCI ROAD TEST:
CHEVROLET BEL AIR SEDAN



►Bad reputations die hard. To SCI readers that of the American car is no exception. We have praised, perhaps too fulsomely at times, its leaps ahead in handling and braking only to be bombarded by readers who insist that Detroit is inhabited solely by advocates of the Devil. Perserverence pays off, they say, so with some hesitancy here we go again.

To our domestic readers at least, the Chevrolet needs no introduction as it accounts for 25% of the domestic market. However, the particular car we tested is stock only in the sense that it carried factory parts. It is not one which you are likely to see on the dealer's showroom floor. Some day maybe, but not this year. More likely you'll see it parked outside, for it was essentially a police car minus the red lights and siren. A four-passenger sedan set-up for hard, fast driving, one that must carry heavy equipment, yet accelerate rapidly enough to nab speeders and handle and brake well enough to chase sports cars—and catch them.

This is not the time or place to discuss the morals of current traffic law enforcement practices, but last time we were Corvette-testing out Detroit way, we casually mentioned that high speed highway driving was taking on some of the aspects of a nightmare, what with radar devices and factory-prepared "pursuit cars." I mean, a fellow hasn't got a chance anymore.

In reply Zora Arkus-Duntov smiled and suggested we pay him a return visit when time permitted, as there were certain options available to all that we owed it to ourselves and our readers to investigate. Okay, we shrugged, so you have hot engines that make the barge go faster than Dick Tracy's. Duntov just smiled and the talk drifted on to other subjects. No, you can't road test the Corvette SS. Etc.

One day the call came in. A 348 near Mound and Twelve Mile. Looked a bit out of the ordinary. We went to investigate.

"Hello, Mr. Duntov, we're from Sports Cars Illustrated."

"Yes, I've been expecting you."

"All we want are the facts, Mr. Duntov."

We went to look the victim over.

Outside. White. Bel Air two-door. Distinguishing marks? Crossed flag motif on hood above nameplate. Same as Impala. Otherwise stock. Inside. Same thing, just one clue. Someone swiped column shift. Replaced with floor shift. White knob on top. Bent to clear seat cushion in full forward position.

Careful questioning of the prime subject in this case, Zora Arkus-Duntov, led to the discovery that this lever was attached to a Corvette all-synchro four-speed gearbox. Sneaky.

Then we looked under the hood. Brutal. Chev's workhorse 348 cubic inch V-8 tethered there. Its rig included the Rochester four barrel carb, aluminum intake manifold, improved exhaust ditto, dual point distributor, double generator belts. Inside, a Duntov cam, 287° duration, 66° overlap. Listened carefully to its breathing. Convinced that compression ratio was neither 9.4 (dead stock) nor 11.25 (maximum hot). Questioned suspect. He confessed. He's trying a slightly lower CR for all around use. Not much lower though. Ten and a half to one. Gives about 310 hp at 5600 rpm.

We tried to move on but suspect was reluctant to leave. There were other options available, too. Three twin choke Rochesters with and without cams. Output 280 or 335. Synchro-only with the latter. Slightly different carbs and cam, too. Quad outputs range from 250 without special cam to 320 with. Latter is cut to 305 with automatic transmission (heavy duty Powerglide incidentally) because a different version of the Duntov cam is used.

So, how much extra over, say, the very stock 283 inch V-8? Answer: 145 pounds and, in this particular state of tune, $172.20.

The four-speed gearbox we'd already noted, it was $188.30 extra. Which is a lot if you can't stand gear changing. We can, so can our suspect.

Next we grilled him about the chassis. Was it really stock?

Sort of. It's called LPO 1108. LPO stands for limited production option which means that it has to be specially ordered. Regular options (RPO) are scheduled down the production line on the basis of estimated demand.

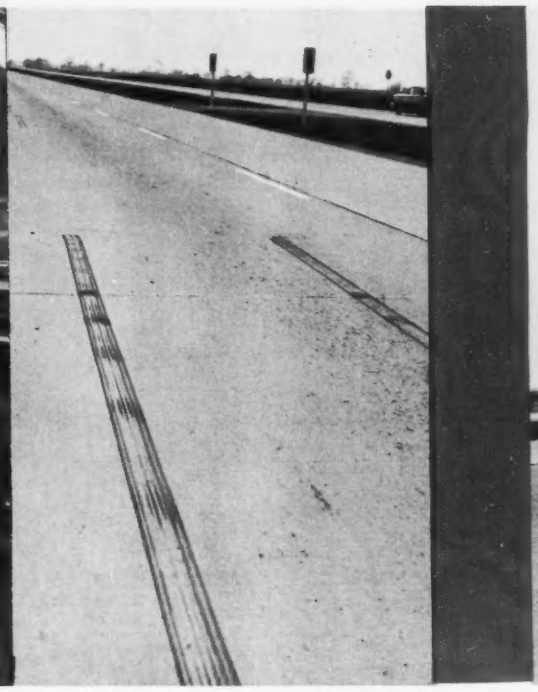
Stick to the facts, please. What's in LOP 1108?

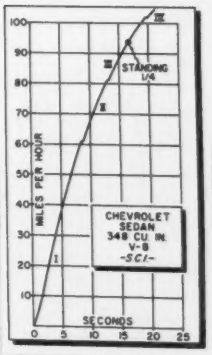
It's LPO, if you don't mind. It's only $44.15 extra and . . .

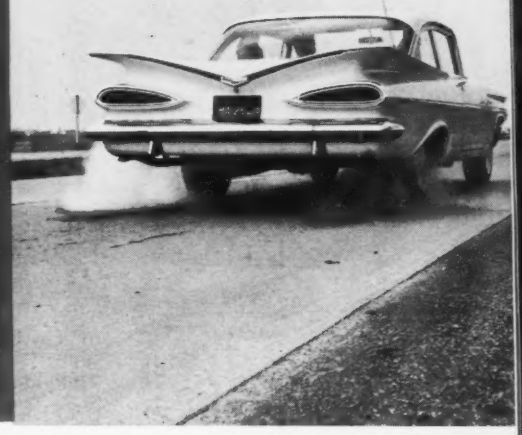
Please. What does LPO 1108 consist of?

All right. Sintered metallic brakes, stiffer springs, larger shocks, heavy duty front and rear wheel bearings, stronger front suspension ball joints and, usually, 6.70 x 15 tires, although this car's got 8.00 x 14 white sidewall nylon tubeless. It's available with any engine, but the exact springs vary with the engine and transmission chosen.

A Family Man's Corvette: With $44.15 worth of chassis options, it handles. With proper engine and gears, it makes sporty cars eat dust.







How much stiffer on this car?

About 30% at the front, 74% at the rear. The HD shocks have 1⅝-inch pistons instead of one inch.

Very good. What about the brakes?

They're vacuum-assisted power brakes. The drums are finished a bit smoother than normally and the linings are sintered metallic pads. Why power? Two reasons. It reduces pedal travel which saves time in emergencies. It also reduces pedal pressure. The reason we make sintered linings so hard to get? Well, they work fine when they're hot, even better than when they're cold. Pedal pressure's sort of high. Old ladies forget to push. Don't stop. Looks bad for Chevrolet. Solution: save them for knowledgable types. Cops and Corvette-drivers, for instance. Even so, you have to fight to get them.

Worth it. Fight hard.

What about the steering?

Manual. Dead stock, too.

Tire pressures?

Use 22 to 24 psi for comfort, 35 for high-balling.

Anything else?

The 1½-inch lower roof line on the Impala requires lower seats, gives more of a Lotus-like slouched back seating position. Make sure you like it before you jump for the lower frontal area.

The grilling over, we released the suspect with a promise to return. Confiscated the Bel Air. Temporarily. Didn't want real cops on *our* tail.

Actually, our idea was not to find out how good this Pursuit Car was as a police car. Instead we were wondering if maybe this would possibly turn out to be a family man's four-seater Corvette.

In road testing a car, perhaps the single most influential feature in molding our opinion, and at the same time the most difficult to describe, is its response. In simple words, does it do *what* you want it to *when* you tell it to?

From the designers point of view, this can be broken down into individual response characteristics, one for each control—the accelerator, the brake pedal, the clutch and the steering wheel. Each has its moments when it is more important than the others so perhaps we can look into them one at a time.

But first we'd better explain that our idea of good response characteristics does not just mean getting lots of action. Rather, that whatever happens as you use the controls should happen in a sensible (perhaps linear) relationship to either the movement of the control or the force or torque being exerted on it. After all, completely gutless cars can be quite exhilerating to drive while smoking, wheel-spinning monsters can be just plain dreadful for highway use. And vice versa.

For instance, while it may be inevitable on some racings cars that power is either all-on or all-off, this is not the stuff that pleasure motoring is made of. And that, incidentally, helps explain how some cars which never win races continue to be popular and well thought of . . they respond nicely to their controls.

This indicates the attitude with which we looked at Chevrolet's "police-equipped" Bel Air—not how useful it is for neighborhood jaunts or cross country journeys, nor how splendid it may be for the Sunday drags or catching speeders. Rather, how well does it respond to the driver's directions and therefore, how close it comes to be a contemporary American Sports Sedan.

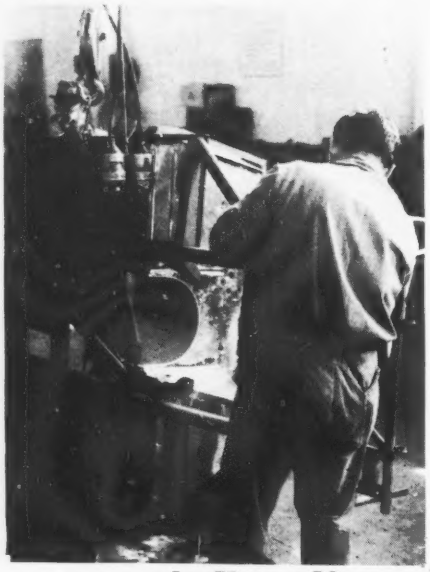
To discuss accelerator response it is first necessary to bring up rear axle ratio. At 3.55 to one it is too low numerically to make rapid standing starts easily. Incidentally, on our first three starts, the Positraction limited slip differential failed to function. The right rear wheel lifted enough to peel off a hundred miles worth of rubber and on the third attempt, we got a spectacular smoke storm brewing in the fender well. Putting the photographer overboard to record this meteorological scene must have jiggled something for every subsequent start saw two mild streaks instead of one big one.

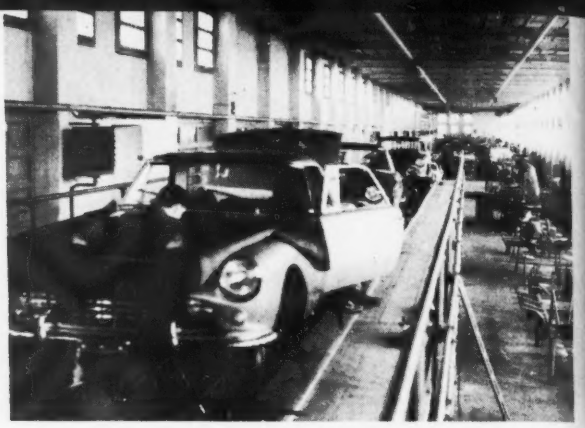
Oddly enough, there was no improvement in 0-60 time once the photographer-timer was back aboard. With both wheels biting, the 2.20 first gear and the 3.55 rear just didn't multiply revs enough and the 0-30 stretch was a painful, staggering march.

Life began somewhere near 40, in earnest, as a glance at the performance chart will show. Further improvements could be expected with the 3.70 gears. Though the 4.11 and 4.56 Corvette gears will also fit, they limit top speed (assuming that 6500 rpm can be reached—which Duntov insists can be done—only 900 past peak) to 124 and 111 mph instead of the 143 possible (but not achieved) with the 3.55's. The 3.70 would give 137 which seems fast enough.

So, what about this responsiveness? Answer: good considering the very high output of this engine (0.89 hp/cu in). However, at part throttle, there is a definite flatspot

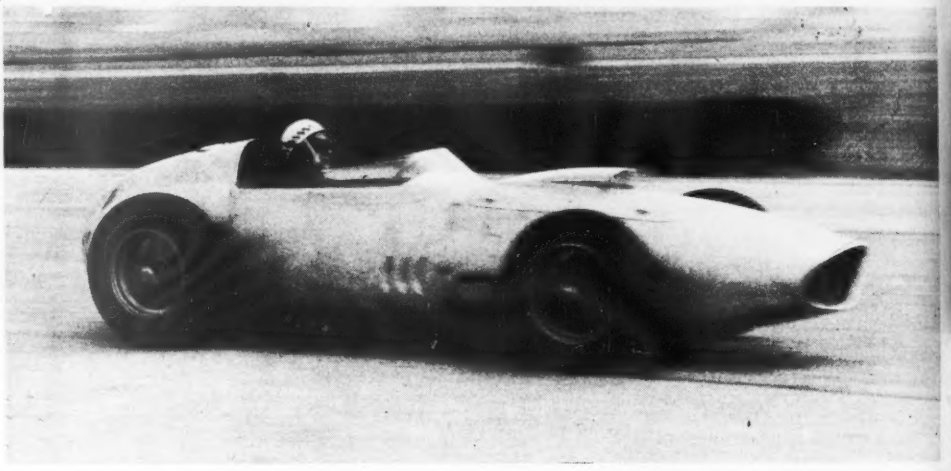
(Continued on page 79)





ITALIAN Holiday

by Henry Manney

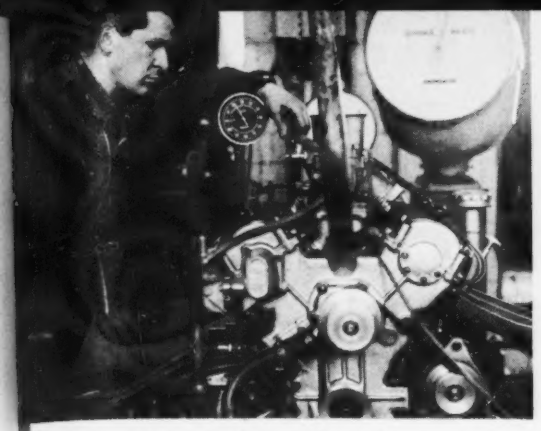


Jean Behra tests the latest Ferrari Formula I car. Pedestrians in and around Modena automatically take cover when a full-blooded race car whines by on the open road bound for the airport test site. A Ferrari comes to life on the welding jig (above). Three car line (upper right) heralds advent of mass production on 250 GTs.

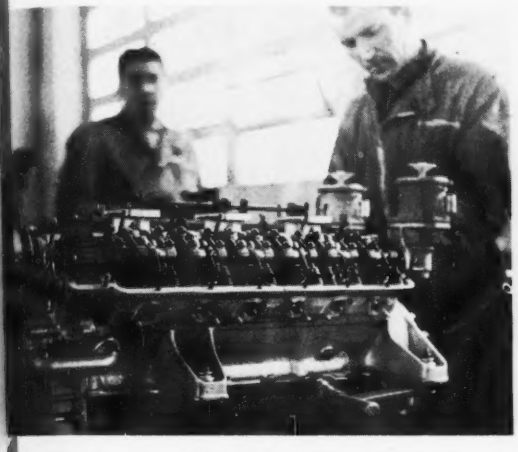
► Not long ago, an opportunity presented itself that enabled me to escape from the press of multifarious duties (not to mention wife and kiddies) and go down to Modena for a few days. Those of you who are not steeped in the gospel of streamlined air compressors and Sturm und Drang mit Herman Lang will remember that the ancient capital of the Dukes d'Este is also the hatching place of the somewhat better know Scuderia Ferrari. One therefore finds a lively awareness of motor-racing problems, reminiscent of some parts of Southern California, which has attracted the Orsi-owned Maserati factory in addition to sundry carrosseries, light engineering works, the inevitable pepper-tree engineering establishments, and various other ancillaries dear to the heart of the enthusiast.

I was to meet a colleague at Milan and then we were to drive south together. Sparing by aged Giulietta the rigors of the mickey-mouse train through the Simplon tunnel, I grabbed the morning rattler from Lausanne, and after a short sharp battle with a clam-eyed Schwyzerdütsch lady who refused to vacate my (reserved) seat and another ditto with the ditto concessionaire whose little cart had no coffee left at 8:30 ayem (Swiss trains apparently have no diners), settled down for the 4-and-½ hour trip. I gazed at the scenery, which included a nice assortment of Alps, sundry railroad yards, the islands on Lake Maggiore, and a long black tunnel, while my Swiss compartment-mates, as is their custom, stared openmouthed at me and each other.

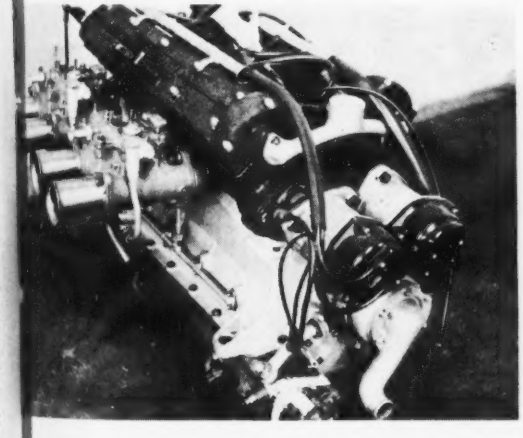
Roughly on time, the Italian State Railways decanted us at the Stazione Centrale in Milan. Surviving with aplomb the thunderous rush out into the corridor twenty-five minutes before the train actually came to rest, I collected my luggage from the rack and strolled down into the station proper to wait for friend Eddie. Taking station by the large model of the Cristoforo Colombo, I watched the constant swirl of excitable Italians around the gates and espresso bars . . . everybody seemed to be almost late for something; fat mommas in black, waddling agitatedly along, beckoning to their shapely and besacked daughters; short men in shorter jackets, drainpipe pants, and big insteps, and the convoys of red-faced farm families, shining with the patina of age, clutching brown-paper parcels and chianti bottles against starvation (and the city slickers) as they embarked into the unknown. My attention became riveted to a sweet young thing undulating towards me, a welcoming smile upon her ruby jaws. Carefully I looked behind me to spot the Adonis that had attracted her attention . . . my heart beat faster as I ascertained that nobody else even remotely eligible, barring two Carabinieri in Napoleon Bonaparte hats, was near. As I turned back in anticipation, however, a melodious voice smote the ear; "Hallo, Henners, did you



Dino 2000 cc engine on the test rig. No internal Public Relations Program is needed at Ferrari — toilers know they build the best race cars.



Engine assembly at Modena means one man, one engine — not a gum-chewing blonde in slacks pushing the go button on a machine that make 500 mills every hour.



Maserati fortunes have ebbed and flowed for years. One thing is sure — there will always be Trident-adorned cars on the starting grid. New 2000 cc sports engine (above) proves that this is so.

think we were never coming?" Curses; I knew the girl. T'was Ann Wisdom, of rally fame, who was just returning from the Sestriere and had cadged a ride with the elusive Eddie.

Flinging baggage into his car, we enlisted the professional services of Mlle Wisdom ("hairy flatters down this street . . .") to navigate us to a proper feed of fagioli e piselli alla Toscana, then set out on the autostrada to Como to drop her off at Lugano, where she was to meet some friends. Eddie was to write his rally story, and I was to snooze uninterrupted by squalling brats. Next day, we set off to Modena minus navigator, first passing via Milan airport to send pix and story off to Fleet Street, a little job which earned us no end of cachet among the airport attendants. Dropping by Alfa Romeo to pick up a road test Spyder hardtop from the cheerful Signor Bernasconi and his squadron of shapely secretaries, we transferred some of the baggage from Eddie's Peugeot and set off through smoggy Milan. Toot sweet we found ourselves on the new Autostrada del Sole, a new freeway (except that it isn't free) which is to run from Milan to Naples, thus affording the private motorist a chance to escape the sustained phenomenal avoidance which is a feature of the normal Italian road system today. As of now, the finished section runs as far as Parma, with the exception of an uncompleted Po River bridge which necessitates a detour through Piacenza. It was interesting to feel the difference between the Spyder, which happened to be fitted with the Sprite engine, and my veteran Veloce. Naturally enough, the Spyder was quieter mechanically except at higher speeds, where the better breathing and higher final drive of the Veloce told, but the wind noise was practically the same in spite of the sliding windows on my car. Handling seemed similar, as one would expect, but the ride seemed softer on the Spyder in spite of its shorter wheelbase, due partially at least to its having Pirellis instead of my wear of Michelin X. Also the seats were curiously uncomfortable, giving me rather severe leg cramps; a change from the pain in the back I get in mine!

In due course we arrived at Modena and shot right out to the Maranello Ferrari works; unfortunately the bod that we knew was not there so we turned right about in front of the hammer-and-sickle painted town hall and did the Mille Miglia bit back to town. An interesting aspect of this road is that the pedestrians (which include people, dogs, cats, chickens, and for all I know insects) display what used to be known as the Messerschmidt Twitch to a marked degree. At the slightest sound of either high-revving engine or screaming tires, all and sundry leap for the nearest off-stage solid object and stay there until the danger is past; a syndrome perhaps brought on by the fact that Ferraris test their cars up and down that piece of the Strade Nazionali. Inasmuch as I have also been passed at full blat by a V8 Lancia-Ferrari on the public highway when encased in an iron automobile, it's easy to understand their "naked" concern. Although being crammed up the air intake of a Dino 256 is perhaps not the worst way to go.

But I digress . . . threading our way through the five-o'clock bicycle rush, which parted before our klaxon as the waters of the Red Sea, we steamed up to the stylish red-brick Modena shop and sought entrance. Naturally enough they had never heard of our acquaintance either, or barring that he wasn't there; the sesame opened not until we thought of the magic name of Tavoni, the racing team manager. We knew him well, of course, having seen him at most of the bigger events, and surely enough, having been summoned on the rather antiquated tube, he speedily came forth to greet us. Rather resembling a stork with spectacles, this studious and pleasant young man is not *my* idea of what a Ferrari racing manager should look like, having visualized a short, swarthy, garlic-breathing type in blue Pirelli suit, mustachios aquiver, with a belt stuffed full of knives and salamis shashlik fashion. However, the proof of the pasta is in the mangiare as Sparafucile once said, and the Modenese do manage to win a motor race now and again.

Assuring himself that we all could really communicate in a mish-mash of French an Italian, he straightaway gave us a quick conducted tour of the building, which, he explained, was really reserved for repair and delivery of customers' cars. Casually strewn about were six or seven GTs including Schell's last year Tour de France coupe (still rather wrinkled), an old Formula 2 for the Centro-Sud drivers' school, a rebuilt engine running happily on the test bed, and a motley collection of sports Ferraris in various stages of decrepitude waiting to be repaired and/or sold. All this, while interesting, was really not what we had come to see, so prying a letter out of him which would admit us to the Holy of Holies on the morrow, we made tracks for the Albergo Reale.

The Reale, situated fortuitously on the ancient Via Emilia, is a very clean and pleasant hotel, besides being rather like *the* soda shop on the campus. Everybody who is anybody . . . except plush expense account types who stop at the Palace . . . come to the Reale and you are sure to meet all your motor-racing acquaintances there sooner or later. Besides a couple of reporters from the French sporting paper L'Equipe, we were soon rubbing elbows with Jean Behra, Colin Davis and A. De Tomaso of Osca fame, Richie Ginther, writer Pete Coltrin, and several subdued young gentlemen who were there on some wild-goose-chase about getting a ride with Ferrari. Pete spirited us across the street to his favorite pub and we had a lovely dinner or tortellini al ragù, breaded veal cutlet, cheese, and fruit, plus a couple of bottles of the local Lambrusco, for the shattering sum of dollartwentyfive . . . and these are town prices. Out in the country it's cheaper, but you don't have three waiters. And so into the bar for a Strega (a 100 proof — SAE 90 liqueur), dodging bronzed Maserati driver Maria Teresa de Filippis and a covey of squealing Italian quiff, and so to bed.

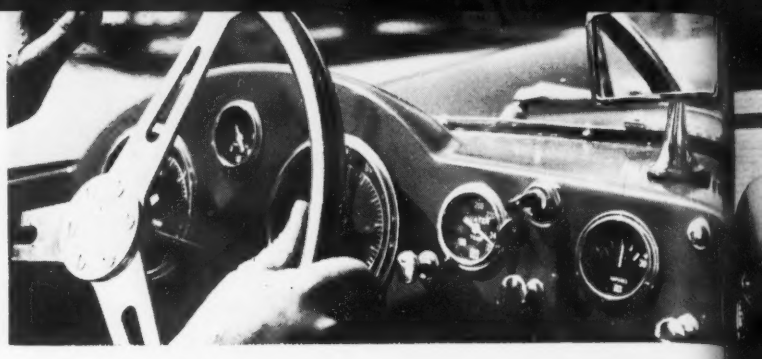
Next day up bright and early, and in spite of a breakfast of tea (ugh) and rolls as the waiter had thought we were both English; into the Alfa and out to Maranello once more. This time the grim guardian of the gate was more cheerful,

(Continued on page 77)

Will this Irish chassis be happy with her muscular 'merican mill?

ERIN GO BOMB

by O. C. Ritch



►Though stern men of Eire frown on Americans who drink Irish coffee ('Tis a waste of good whisky, boy"), their Belfast brothers are happily preparing an automotive mix of Irish and American ingredients which will waste neither engine nor chassis nor body. Like that powerful drink, it will be potent beneath mild-mannered looks. Under the sponsorship of Californian Bill Devin, the Northern Ireland firm of Devonshire Engineering (no relation) is busily building exciting chassis to fit around Chevy 283-inch V-8 engines and transmissions inside of Devin's fiberglass bodies.

The final stuffing and skinning is done in sunny California, but all the welding takes place in Belfast. By doing the handwork abroad, the price of this Complete Grand Touring car will be kept to $5950. Grand Touring? Yes indeed, because with a price this low, it should be easy to build and sell the 150 units required for the FIA homologation.

Although the first Devin SS has yet to be seen on race course, it is safe to say that interest in the new hybrid exceeds that for anything that's come down the pike in recent times. Not that the "Super Shillelagh" is the fastest sports car in the world, nor will it be the cheapest, but it will have fair claim to the title of "fastest-cheapest."

There is a vast difference in the approach taken by the special builder and that of the constructor who hopes to make a business of selling high-performance cars. There are not many who care to tackle the latter endeavor. There is ample reason: the high cost of materials, expensive labor, and the necessity for marketing through conventional channels usually add up to "all work and no profit." Over a period of time, the establishment of smooth-flowing production, jockeying for better prices and cutting a few corners can turn loss into profit, but this may take months, even years, and a fat bankroll can melt like ice cre[illegible]

Wood-rimmed racing type steering wheel (far left) is standard equipment on Super Shillelagh. Plastic windshield on prototype car proved anything but distortion free. If every husband had one of these (center left) in the driveway there'd be no argument about who was going to drive to the store. Exhaust system and fuel filler (below) make it pretty plain that the Devin will be no stranger to U. S. road courses.

July. There are few who care enough to chance the depletion of the bankbook so the Devin SS occupies a unique niche in this land.

The Devin stands a far better chance to get off the ground than most attempts of its nature, because only a portion of the car must be constructed here. In Europe, a source of properly sized components is at hand and labor is less costly. Thus, the Devin chassis, complete to wheels, represents a good part of the nut already cracked. After shipment to California, the body, engine-transmission and trim are installed and the finished car can be marketed. If the entire automobile were built here using the same parts, the cost would be approximately doubled.

Given a halfway favorable production climate and with ready buyers waiting at the end of the assembly line, this SS could well be the first American entry into the top brackets of GT echelons. Certainly there are few automobiles in the world to match its performance potential or its advanced engineering features.

Let's take a quick look at the Devin and see what the unusual combination of Irish fog and California smog can produce. The chassis is based on a big-diameter tube frame; wide, rigid and light. Independent front suspension is by equal length, parallel A arms with Woodhead-Monroe coil springs and concentric shock absorber. At the rear, a husky de Dion tube connects two axle halves emerging from a frame-mounted Salisbury centersection. Rear suspension is located by parallel trailing arms and a roller bearing centering pin in a vertical slot. Springs and shocks are, again, Woodhead-Monroe mounted 15° off vertical.

Disc brakes by Girling are used both front and rear. Twelve-inch discs with quick-change caliper pads are fitted to the front wheels while eleven-inch units are mounted inboard at the back. Rack and pinion steering, hanging pedals, dual brake master cylinders and hydraulically operated clutch are other features.

The power train begins with a Chevrolet Corvette engine, 283 cubic-inch displacement, and continues through a 4-speed gearbox of the same origin to a stubby driveshaft to the aforementioned Salisbury final drive.

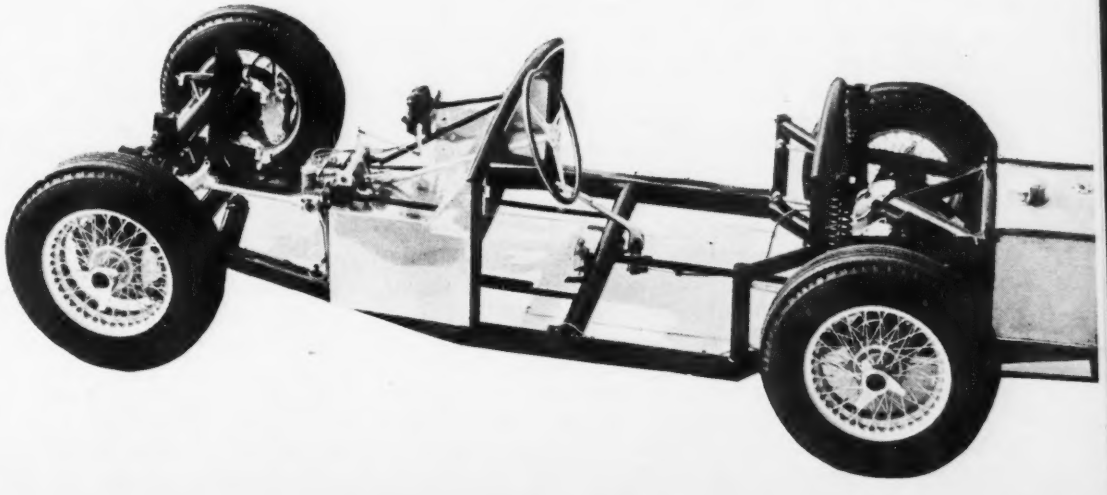
An entirely new Devin fiberglass body has been designed for the SS. It bears a family resemblance to the well-known units, but is much huskier in appearance and has undergone particular refinement around the cockpit area and tail to increase luggage space. A full safety glass windshield will be fitted, and provision has been made for both a folding soft top and a removable hardtop (fiberglass, of course).

Weighing in at 2,000 pounds in touring trim, the Devin SS offers acceleration like a turpentined panther, braking and handling equal to top track machinery plus touring comfort. The price: $5950. El Monte, California: add applicable tax and license.

With all these good things, one may ask "What's the catch?"

There is none . . . except meeting the demand. And this seemingly healthy situation is fraught with imminent peril, as W. C. Fields used to say. The reefs of past automotive history are studded with wreckage of companies who promised much, excited the populace and then couldn't deliver. In introducing the Devin, the people concerned emphasize that initial deliveries will not be in quantity and will, in all likelihood, consist of cars designed specifically for competition. An uncommonly long time has been spent in testing and development so that a bug-free unit can go into real production on an economic basis. With this sound approach, the prospects that many of us may own such a highly desirable car are a whale of a lot better than if unbridled enthusiasm reigned.

Devin SS besides being a pretty fierce looking machine (left) corners flatter than a new bride's pancakes. Production version will have a different type of windshield with laminated safety glass. Bare chassis (right) shows why the new Irish-American handles so well.



DEVIN "SUPER SHILLELAGH"

Price at Pasadena: $5950
North American distributors: Evans Industries,
1276 East Colorado St., Pasadena, California

PERFORMANCE

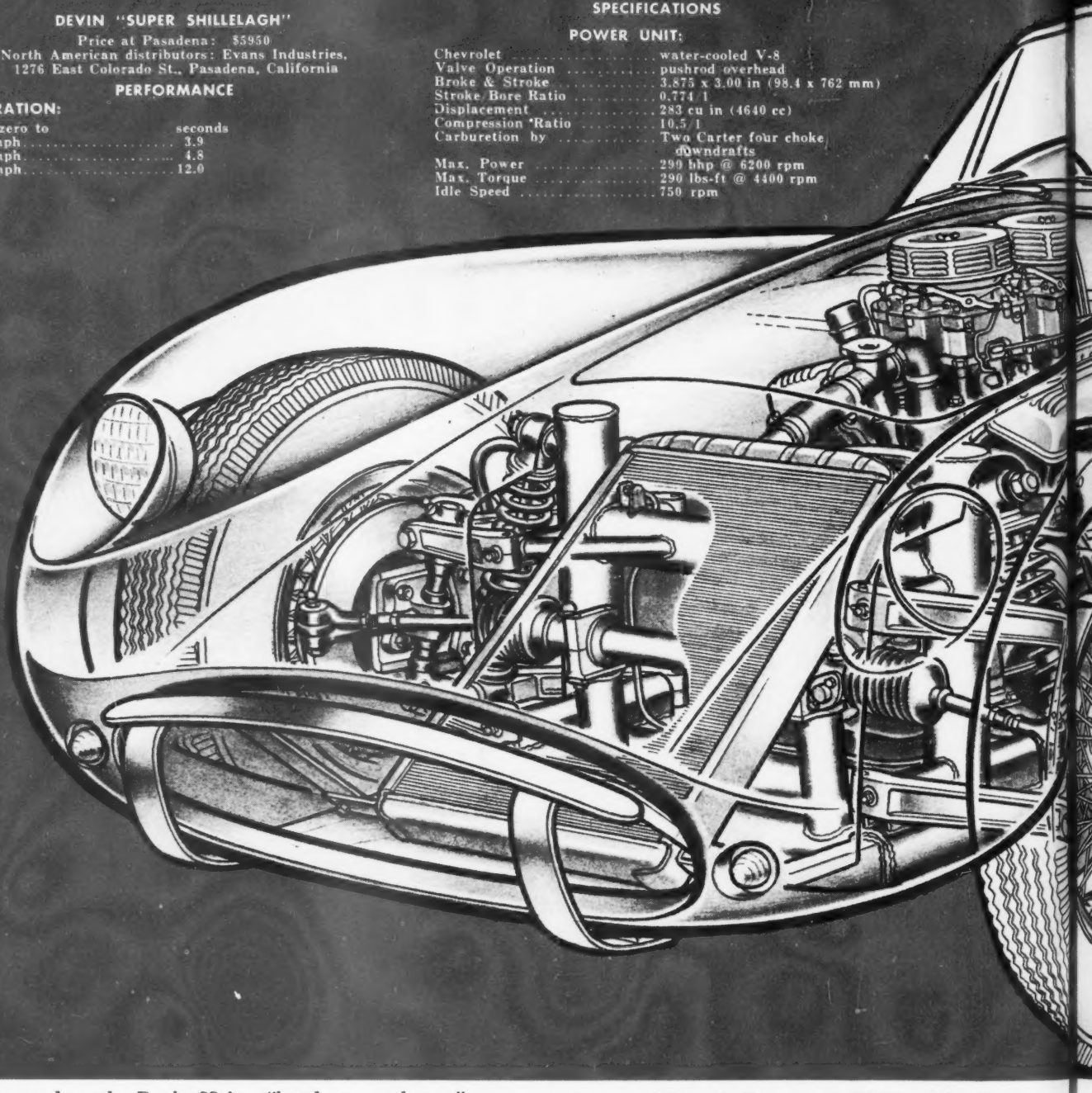
ACCELERATION:

From zero to	seconds
50 mph	3.9
60 mph	4.8
100 mph	12.0

SPECIFICATIONS

POWER UNIT:

Chevrolet	water-cooled V-8
Valve Operation	pushrod overhead
Broke & Stroke	3.875 x 3.00 in (98.4 x 762 mm)
Stroke/Bore Ratio	0.774/1
Displacement	283 cu in (4640 cc)
Compression Ratio	10.5/1
Carburetion by	Two Carter four choke downdrafts
Max. Power	290 bhp @ 6200 rpm
Max. Torque	290 lbs-ft @ 4400 rpm
Idle Speed	750 rpm

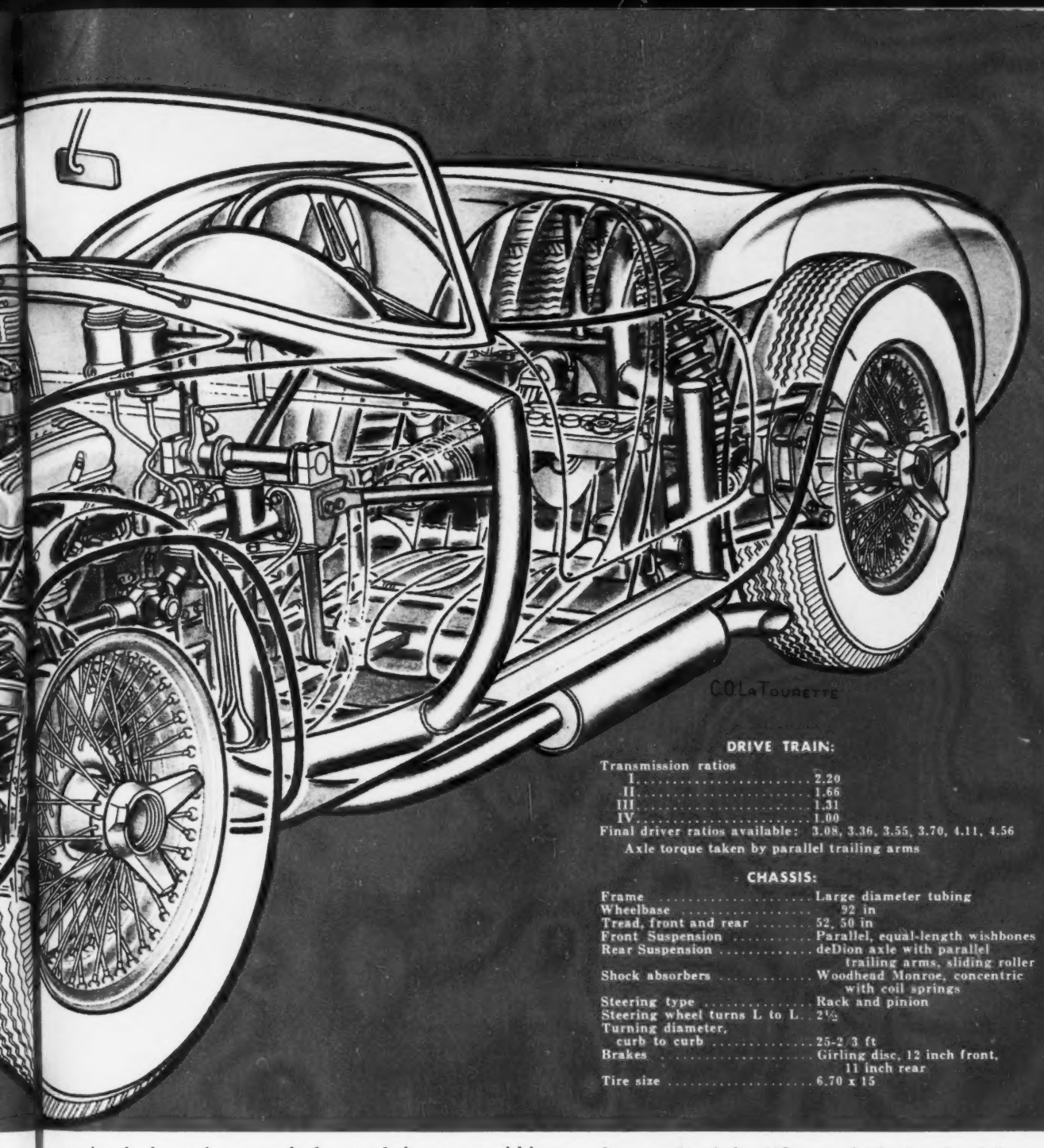


Background on the Devin SS is a "hands across the sea" deal which has been tried before, but not quite on the same basis. Well over a year ago Malcolm MacGregor, a young Belfast sports car enthusiast and engineer, contacted Devin Enterprises with the idea of buying a fiberglass body for a special he was at work on at the time. Including a description of the chassis with his letter, he inquired if any of the Devin bodies would be suitable for this Jaguar-powered 90-inch wheelbase piece. In reply, the Devin organization expressed an interest in a chassis which showed such originality and aptness of design. In succeeding correspondence, photographs and drawings were exchanged. It became apparent that there was a possibility of putting the chassis into limited production similar to Lotus or Lister. Devin was intrigued with the idea that there might be a market for such a unit modified to take the popular, and powerful Chevrolet V8.

The prototype, now in this country, shows the same type of construction that might be found in many shops in this land except for the use of typically British, functional "no frills" accessories. The front suspension uses Woodhead-Monroe units in conjunction with welded tubing upper A-arms while spindles are of BMC origin. Lower A-arms are forgings such as those used all around on the later chassis. Eleven-inch Girling discs are fitted in front on the prototype, and Alfin drums inboard at the rear. An oversize 5" core radiator with a custom top tank backs up a finned oil radiator designed to accommodate a dry-sump Jaguar tuned to "C" modifications. The right-hand-drive steering is rack and pinion with two turns lock to lock. All electrical and hydraulic centers are located high on the aluminum firewall and toe box.

A single large cross tube braces the frame but several smaller tubes run laterally to triangulate the stringers and add stiffness. The chassis, without engine, can be lifted from the front by a person of average strength without so much as a grunt.

The rear center section is mounted much the same as in the Chev-powered model, but the de Dion tube is centered by a plain stub block. Tested at the Belfast Club's course (described as quite a bit like Pomona — a relatively short, twisty track) the Devonshire, as it was called at that time, put up some respectable times. Mounting a Stagel-tuned 3.4 litre Jag powerplants, the chassis without benefit of wind-



DRIVE TRAIN:

Transmission ratios	
I	2.20
II	1.66
III	1.31
IV	1.00
Final driver ratios available:	3.08, 3.36, 3.55, 3.70, 4.11, 4.56
Axle torque taken by parallel trailing arms	

CHASSIS:

Frame	Large diameter tubing
Wheelbase	92 in
Tread, front and rear	52, 50 in
Front Suspension	Parallel, equal-length wishbones
Rear Suspension	deDion axle with parallel trailing arms, sliding roller
Shock absorbers	Woodhead Monroe, concentric with coil springs
Steering type	Rack and pinion
Steering wheel turns L to L.	2½
Turning diameter, curb to curb	25-2/3 ft
Brakes	Girling disc, 12 inch front, 11 inch rear
Tire size	6.70 x 15

cutting body work was pushed around the course within a couple of seconds of FTD established by a Formula II Cooper on the preceding weekend. Handling was described as "extraordinary" and braking as "completely adequate."

However, with the idea in mind of making the car available in the United States with the less expensive but more energetic Chevrolet V-8 in place of the Jaguar Six, it was thought best to make some structural changes. In fact, with the exception of the front and rear and designs, the whole unit was considerably re-arranged.

Initially the wheelbase was upped two inches to allow for greater passenger and driver comfort and to increase high speed stability. The frame was also altered to compensate for the Chevy's greater width and to put the frame rails outside the cockpit. Now the seats are inside the substantial framing. The front rollbar was raised to support the body directly to eliminate welding of extra formers. Additional big tube cross bracing of the frame replaced the small-tube triangulation and served the added purpose of providing a mount for the Corvette box.

As mentioned previously, Girling discs of greater diameter are now fitted in front with the elevn-inchers and have replaced the Alfins on the back axle of the prototype. The anticipated higher speeds of a V8-urged machine and the simplicity of reline jobs instigated this brake change. A stock Corvette radiator is used on the later type, being installed here in the States.

The workmanship is well above average for this type of car. The chassis has the appearance of having been prepared for a Concours d'Elegance, and a number of small but important touches reveal that continuous production is envisaged.

The A-arms, for example, are special forgings, not welded tube or units borrowed from another car. The reason is one of plain necessity, plus economics. There is no stock front suspension meeting the requirements for equal-parallel action needed to retain constant camber that is still light enough or strong enough. Jig-welding these pieces runs into much labor and time and the finished product does not have the quality of appearance of these compact forgings. A stock kingpin and stub axle assembly is entirely adequate, therefore it is employed.

The same is true of the steering. Rather than mold the frame to accommodate the whole unit, it has been modified

to operate in the most ideal location for access and service. A doubly U-jointed steering column gets the twist of the racing wheel around the Corvette's rocker cover and into the rack and pinion. Steering is smooth, light and precise. The wood-rimmed racing wheel is a stock item, too.

Moving back to the pedal department, these important adjuncts have been placed slightly farther apart than is sometimes found in British sports cars . . . perhaps we wear bigger shoes here. At any rate the position has been set up as though for competition, flat, narrow pads are fixed to all pendant levers. The dual master cylinders, one for front and one for rear brakes, operate on a yoke allowing for indicidual adjustment. Cast of aluminum alloy, they are, along with the clutch cylinder, mounted to the frame ahead of a shaft which supports the three pedals.

The throttle linkage, too is ball bearing mounted. All rods have ball-socket ends. Smooth travel and no binding are the result of much attention to detail here, an area too often neglected. Two reservoirs mount on the firewall above the hydraulic cylinders to assure a supply of fluid. All lines are clipped to the frame and are laid out to take advantage of its protection.

The battery and generator are mounted at either side of the driveshaft just ahead of the rear U-joint. With power taken from a pulley on the shaft, generator drag is considerably less than when coupled in the conventional manner and turning at a reduction of engine speed. A spare wheel and tire locks in place directly above the differential and in the finished car occupies only a small portion of the luggage area.

By shifting the fuel load to tanks built integrally with the rear fenders an uncommon amount of space has been gained for stowage of baggage, the soft top, a car cover, etc. The fenders are sealed with a liquid synthetic rubber compound as a double safeguard against leakage and after exhaustive tests have proven harder to rupture than conventional tanks. A two inch pipe connects the two individual tanks and a balanced load is maintained at all times.

Dunlop is providing a special triple-laced wire wheel made up from one of their 15" rims and a hub with the correct offset. Although stock wheels have been used on similar specials it has been discovered that additional strength is required when the fast stopping disc brakes are employed.

Having dealt with the imported section at some length, let's take a look at the contribution of the homeland. First of all, a set power package will be established for production. Actually, this could be any variation of the Corvette recognized by the SCCA as "stock". . . Duntov cam, carburetion or injection, etc., but, to simplify the offering, the SS will probably come with only the cam and dual four-barrel carbs. Being tried now are a pair of Carter four-throats on a special low manifold. As original equipment on 1959 Dodges, these pots are squatty, have dual float chambers and offer easy jet access. Power obtained over stock Corvette carbs is, by mere observation, (not Dyno) considerably enhanced in the low and middle range. Tuned headers, mandatory for competition in the 4.7 litre Class C group, will not be a production item under present plans, but the regular "ram's horn" Corvette manifold which serves adequately will be fitted. Short, steel-wool or fiberglass packed "custom" mufflers lie alongside each outer frame tube and will be covered with a stainless steel or chromed perforated guard reminiscent of the Jag XKSS. No changes in the ratios of the 4-speed transmission are anticipated but the shifting lever has been reworked to bring it farther ahead. The handbrake lies alongside the driveshaft tunnel and operates a pinch on one rear disc.

Instrumentation is complete including a 10,000 rpm tach, 200 mph speedo, oil pressure, water temperature, ammeter and fuel gauges. The rev counter and speedometer are big (4½" dia.), white on black, illuminated, and the tach has an adjustable redline pointer. Turn signals and switches are within close reach.

Both the driver's and the passenger's seating positions are roomy and comfortable. Entry into the low slung speedster is made easy by a new door line, cut down to the frame, and the molded bucket seats which counter smoothly into the body. Floors are fully carpeted and padded with a layer of foam rubber beneath the carpet. Pleated vinyl upholstery over thick foam is attractive and soft enough to satisfy the most angular, while the design of the seat forms is suited to building up an individual pad for the serious competition driver.

The fiberglass body emerges from a female mold so slick that it has to be worked with fine sandpaper before paint will hold. The Devin molds are substantially beefed up so that no warpage or twists arise during the curing process. The two-piece-body shell is laminated togther; doors, cockpit liner, hood, deck lids and lights are installed before being transferred to the chassis. Fiberglass paneling to form wheel wells, deck space and other undertray parts are prepared on individual molds. These pieces are laminated to the body and to the chassis with the same materials used in the original shell so that the finished body is a solid, rattle-free unit, firmly attached to the chassis. This method has been proven in several hundred Devin conversions and results in a highly satisfactory installation. Once unified with the chassis, the body is finished in a conventional manner. In point of fact the bodies look so conventional that onlookers feel compelled to thump them to satisfy their curiosity as to material. It is easy to see where many thousands of dollars can be invested to produce a series of cars. It is fairly certain that the Devin SS will not be a paying proposition until enough can be built in rapid-fire order to allow full use of jigs, fixtures and routine assembly. Every move so far has been made with that prospect in mind, otherwise, only bare chassis, special engine installations and modified-sports class racing machines would have been turned out.

The Devin is scheduled for comprehensive testing and improvement program based on findings from runs at Riverside Raceway and on around-town touring. Preliminary bugs include a tendency to run hot in traffic. This will be thwarted by installation of thermostatically operated electric fans, as used on occasional Ferraris. The bright red car shown in the action photos also suffers from a shade too little ground clearance when steep driveways are considered. As a track item it wouldn't make a great deal of difference, but when you have to depend on the neighborhood gas pump for fuel, it is a hazard.

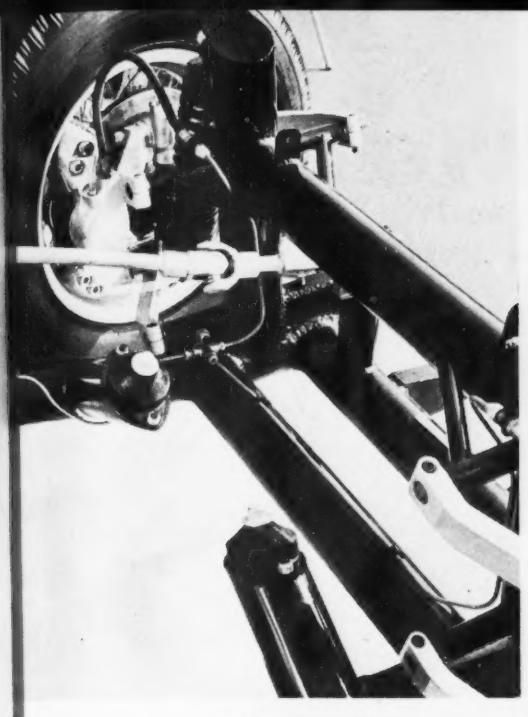
Handsome chormed bumpers set off the Devin both fore and aft and afford a measure of protection from unseeing parkers. Still a set of Sonic Shields would seem a sensible purchase for the Devin owner, the extreme lowness of the entire car making it almost invisible to drivers ahead.

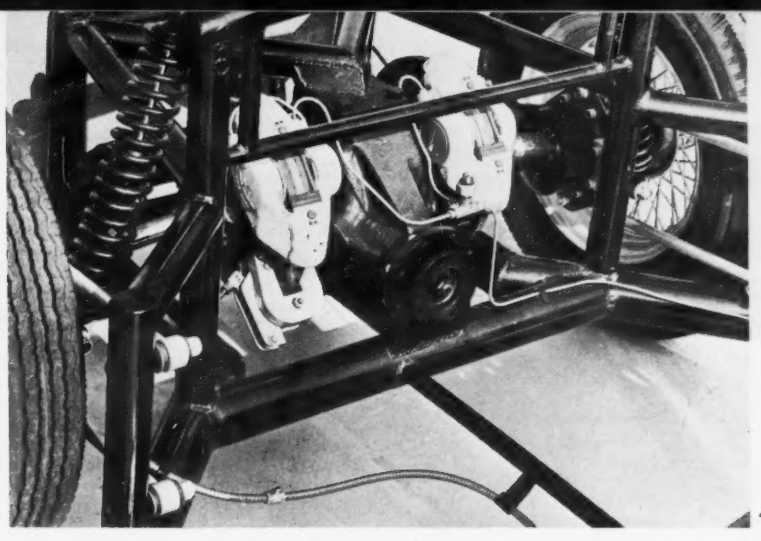
In the hands of Pearce (Pete) Woods, the first V-8 powered SS was wrung out as well as a brand new engine and drive line would allow. Pete, who has racked up an impressive record on the West Coast in a D-Jag, was high in his praise for the Devin's handling abilities.

"This de Dion rear end is the answer for getting a bite coming out of corners," Woods said. "Even with a locked differential in my D-type, it would never take hold the way the Devin does."

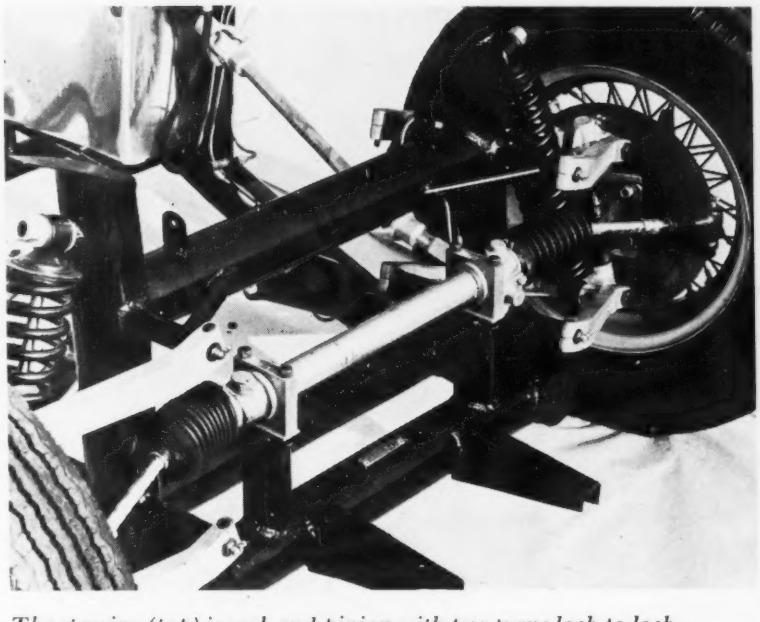
Based on the preliminary figures, the Devin should fall into about the same category of performance as the Jaguar XKSS, with the added bait of still more beans yet available in the engine.

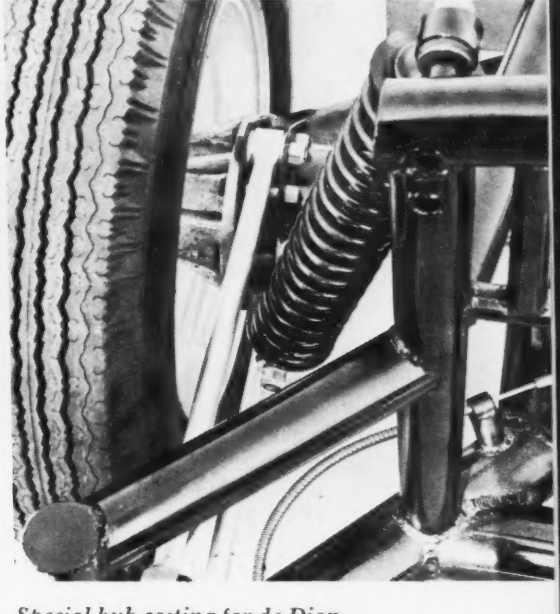
There are no plans for a Devin racing team, at least for factory sponsorship, but numerous inquiries have been received from well-known competition figures who would like to campaign one or more of the cars, and there is some evidence that the first half-dozen or so cars will be finished





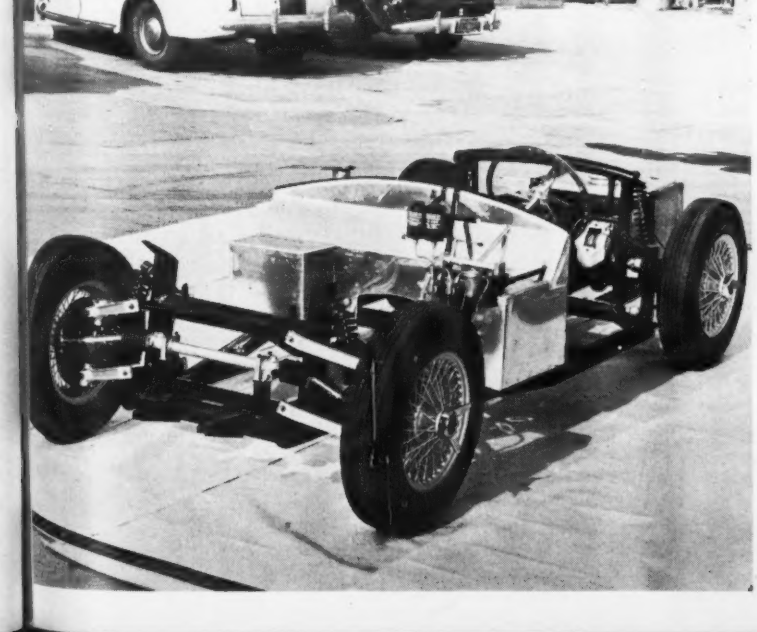
De Dion center section is mounted rigidly in the SS frame (above). It helps keep both rear wheels on the ground during acceleration. Devin chassis (left) set up for installation of Corvette engine. Support for A-frames, disc brake, and one steering U-joint are also clearly defined in this detail shot of the left front section of the Shillelagh chassis. It's evident that the designer took the credo of "Simplicate and add lightness" to heart.





The steering (top) is rack and pinion with two turns lock to lock — fast enough to suit the shortest courses. Devin SS chassis on arrival in California (below) is a good example of sanitary workmanship. Corvette power hooked to a 92-inch wheelbase has to be felt to be believed.

Special hub casting for de Dion rear end (above) also positions trailing arm, combination coil spring and shock absorber.



factory sponsorship, but numerous inquiries have been received from well-known competition figures who would like to campaign one or more of the cars, and there is some evidence that the first half-dozen or so cars will be finished with racing in mind. These would have "all-out" powerplants and suitable modifications to enable them to compete in the non-production categories. In line with this idea, Devin has designed a finned aluminum differential housing to replace the Salisbury case to take the spicer-built (Positraction, Powr-Lok, etc.) limited slip third member. This equipment will be fitted to competition cars at extra cost.

At present, work proceeds on a neat hardtop. All tooling has been finished, a number of chassis have been shipped and the Belfast factory is stepping up production in anticipation of brisk sales. By next fall, wth luck, the U.S. may have a rather enviable product . . . a $10,000 production sports car you can put on the road for six G's one which can show its heels to competitors that cost twice as much.

Monte Carlo Modes

It takes more than a road map and a plastic windshield scraper to finish one of Europe's toughest rallies

by Hugh McGrillen

Only the plastic snow deflector (above) and rally plate show that this is something special in the way of Simcas. Twin scoops ahead of the windshield channel heated air from engine compartment over glass. Sideview (below) gives some idea of the attention given to creature comforts. Navigator has reclining seat complete with headrest, while the assistant navigator in the back seat is equipped with a desk and built in computer. Extra speedometer is driven by cable off the right front wheel.

►A quaint Ford V-8 slammed the odds and a lot of very high class opposition to win the Monte Carlo Rally in 1936. Mystery was woven into this piece of history. How could an odd-looking, V-8 beat those Super-Sports Delahayes, Bentleys and Hotchkiss? It was only last year that the truth of the matter came out when Christea, a lion-hearted Roumanian confessed in a British weekly, "The Motor", that he and co-driver Zamfirescu had driven the entire rally with a solid rear axle;—no differential,—if you see what I mean.

In his own words, "It was helpful on snow but frightful to drive on ice." I'll take his word for it;—you can get a thrill by proxy, even thinking about it. However it was a must for his plan for winning the final driving-test,—which he did. The organisers in those days were fairly liberal in their regulations regarding cars. They allowed plenty of openings for "inspirations" but with creations like Christea's and that other Slavonic genius Col. Berlescu's, it was obvious that things were getting out of hand. (Berlescu appeared the following year with a fabric-bodied Ford V-8;—a chassis and engine, and a lot of cloth, topped off here and there by some cycle wings, a few lamps and such like impediments to good motoring.)

The organisers had had enough. Regulations thereafter stipulated production cars. It was only last year that modifications were permitted to production Sedans, and at that, they had to go into the Category II—G.T. class and compete with Porsches', 300SL's etc. The mods are rigidly specified and enforced—and do not include license to eliminate the differential. Anyway it is a fair bet that under present average speed requirements, an integral rear axle would be something of an embarrassment.

In the early Thirties the minimum average was a dignified 25 m.p.h. By 1939 it was 31 m.p.h. and in the last few years it has gone up to 37 m.p.h. For the Category II class it is in the early 40's which is brisk, press-on stuff for the time of year. All this time-chasing demands quite a bit of thought by potential competitors. Recently Noel Brooks took me round a Simca that had been entered for this year's Monte Carlo. The car belonged to McCairns Motors Ltd., Irish dealers for Simca (and G.M.) of which Brooks is a production executive. The crew, as in previous years was Cecil Vard, Brooks and Arthur Jolley. This trio are veterans of the Monte Caper, though so far without the required quota of luck.

Preparing a car for current Monte's is as different from Cristea's "inspirations" as the present event is from those earlier explorations. Limited in mechanical changes, the big opening for the "improver" is in the interior equipment, "to improve condition of use." Brooks takes charge of the Simca's preparation and the benefits of plenty of experience go into it. This year's car was a typical example of "what's needed to get you there."

First; the lights,—you've got to see where you're going—even if it's not on the right road. The normal Marchal headlamps are used with yellow bulbs (French regulations). In addition, foglamps, two-angled lamps (for cornering) and a long-range driving lamp were mounted in the radiator grill opening;—not much room left there. A wide-spread reversing lamp was mounted on the boot-lid, and a powerful search-light clamped on the roof at the navigator's side. It can happen that a navigator might want to read the sign-posts.

But you must still see from behind an icelashed windscreen for three days and nights—so the windscreen must be unfrozen. First you need a dash-controlled radiator blind to keep your engine temperature up. Then the heater must be modified to recirculate the warm air inside—not the frozen type from a nearby Alp. More heat;—electric demisters, two front, one rear. Still more heat,—for the outside this time. Louvres were let into the bonnet, directing warm engine air up to the windscreen, and to the wiper arms and windscreen washers—they can't spray ice.

The original facia panel was taken out and replaced by two separate combinations. The right,—all driver-equipment,—the left for the navigator. The driver's instruments were radically altered. The speedo was changed to 'Kiltometre' type—both distance and k.p.h. with occasional miles-per-hour marking for convenience of an eye not used to Kilometres. Temperature and fuel gauges were retained and an ammeter added—very necessary, to audit the heavy battery drain from all that extra equipment. All electric switches were brought to the driver's hand, almost all workable from the steering wheel. The drive controls are all very accessible as standard.

The left hand panel for the navigators contained most of the navigating instruments—(there were more in the 'back office' rear seat operated by the third crew member when necessary). In the front was a Halda speed pilot mounted in the best position for the navigator's eye. The Halda gives minutes late or early for an indicated average—but in the regularity section minutes are not quite enough. In addition to the Halda there were two chronometers synchronised and tested for one minute accuracy in 24 hours. A universally adjustable map-reading light, completely shaded from the driver's eye was mounted. The navigator also had his own windscreen washer button.

In the back, an auxiliary-navigation set-up was installed. It included another chronometer and a Brooks and Brierly (no connection in the 'Brooks') average speed indicator. This speed indicator is the ultimate in that type of equipment. It is driven from a special hub extension on the off front wheel (back-wheel-slip, makes rear wheels useless). Electrically-operated time mechanisms in the indicator, combining with the drive from the front wheel, indicated time;—slow or fast in relation to the required average speed,—to the nearest second. This is vital in the regularity section, about 300 miles of the toughest schedule in the world, where penalties are incurred for every second late or early. A collapsable desk folded down from the back of the driving-seat squab, and this contained the rear-seat time-piece.

In addition to this instrumentation orgy, there was a load of domestic apparatus, flasks, more lights in the interior, tactically-placed brackets for holding bottles. (I couldn't figure out what the bottles were holding—maybe milk—maybe not), and stowed in the boot was the inevitable de-ditching gear. It was needed, too—sad to relate; a spot of digging-out in the regularity test finished their chances.

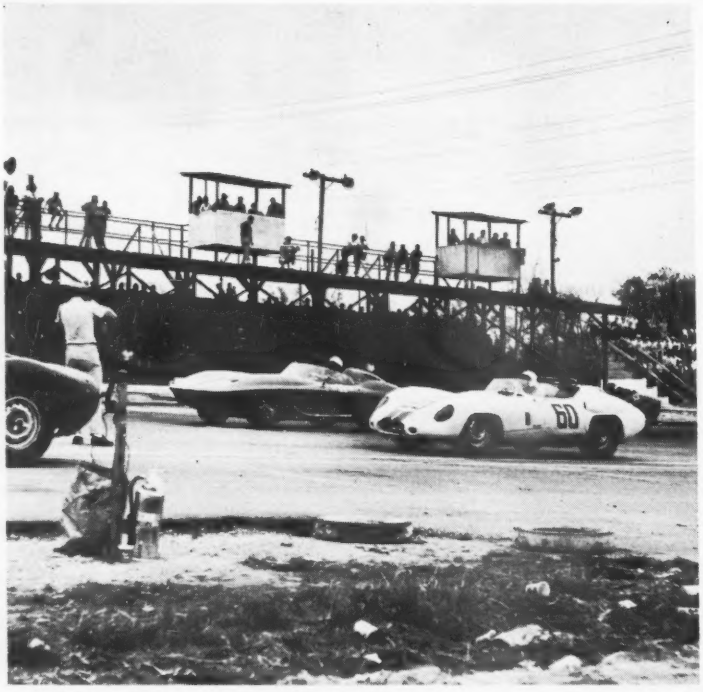
All this equipment throws an additional 300 lbs. on to the curb-side weight—but the Simca Super-Flash engine poking out 57 b.h.p. takes care of it easily, and sends the Monthlery along at a spanking top of 87-89 m.p.h. which is muscular for a 1300 c.c. sedan. The complete load sat on four Dunlop Weathermasters, for which chains were carried "in case of necessity". This is quite standard preparation. There is certainly nothing superfluous—and that point is one of the most significant in the set-up. Too much baggage is probably worse than too little in this event, where a navigator cannot afford two minutes scrummaging-time among a lot of unnecessary junk.

Apart from anything else, the cost of this job, in equipment, is reasonable by comparison with the small fortunes poured into some of the entries. You can, for instance, start by fitting tungsten-studded tires to all four, at the cost of a complete normal set—per tire. The tire problem was interesting this year. The studded version is strictly for snow and ice. Road conditions turned out to be variable, and about 200 miles on normal road surface burns-up the studded tires and gives plenty of practice in wheel changing and tire-mending.

You can spend your life-savings fitting everything — including the wash-hand basin, (one British entrant actually had a wash-up in the rear a few years back)—but at that stage it becomes an exercise in gadgetry, and hardly qualifies as serious motoring. Have no doubts about it, the Monte Carlo is serious motoring. The final road section from Chambery to Monte Carlo this year was nobody's idea of a joy ride. The regularity test was punctuated by control officers being socked on the jaw, (by competitors—naturally), and generally the atmosphere varies between that of a South American political argument, and robust vaudeville.

Some statistical rambling through this year's results, produced the following disjointed facts: In the first five places were four French cars and one British in that order; in the first ten places,—four French, four British, one Swedish and one German. In the first twenty places, seven cars were front wheel drive. Of the first fifty finishers, seven were Volvos, six D.K.W.'s, five Citroens (including 1st and 4th); five Jag 3-4's; and four Porsches and Fords (English).

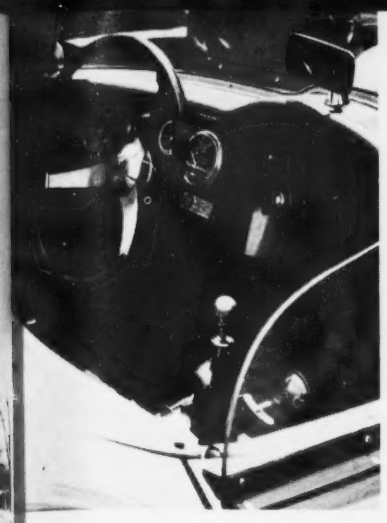
The Simca which took second place was a French-entered twin of the car described here.

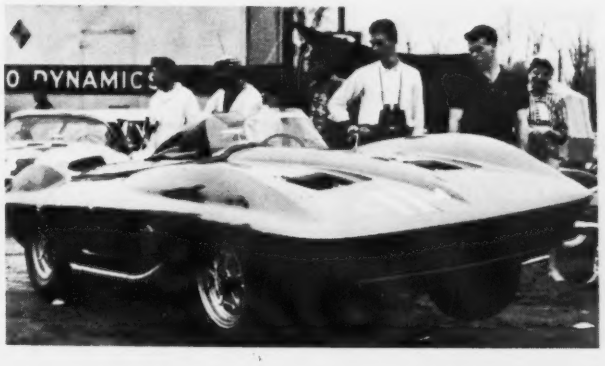


Left: The Stingray and the ex-Sebring Lister Jaguar on the grid during practice.
Below: Dick Thompson brings the car out of the paddock for the start of the feature event at Marlboro.

by Duane Unkefer

THE STINGRAY: THE RETURN OF THE CORVETTE SS





The cockpit (left above) with full-width windshield. When it was found necessary to add a cooling scoop to the rear deck, a section of the screen was cut off to allow air flow (lower right). Upper right photo shows snake-like exhaust headers kicked up to clear space frame. Everybody wanted a close look under the hood but not many questions were answered.

Since its ill-fated debut and subsequent retirement from the racing scene, the SS Corvette, after exhibiting great potential, just seemed to vanish into thin air. A few stories popped up from time to time, including one about the G.M. big brass having ordered its destruction, followed by a cloak-and-dagger routine in which the car was hidden away like the Holy Grail in a successful attempt at eluding the executive Crusaders.

This story may well have been true since on April 18 Maryland's Marlboro Raceway was the scene of the surprise debut of G.M. Styling boss Bill Mitchell's sleek flame-red "Stingray". Right alongside, and serving as Course Marshall's car, was his customized Corvette (SCI March '59) but the Stingray held the spotlight, drawing lots of questions and very few answers.

The flawless and rather way-out fiberglass bodywork of the Stingray bears a remarkable resemblance to its namesake. The chassis is that of the third, previously incomplete Corvette SS, built back in 1957. A full tech report of the SS appeared in the August, '57 issue of SCI.

The frame is built up of tubular members about an inch in diameter, with certain parts square sectioned wherever it was found more advantageous for purposes of mounting other components. The result is a space frame quite similar to that of the 300 SL even to the pyramided tubes at the cowl and truss structure at the sides of the cockpit.

The engine looks like the same one that was used in the Sebring car, but then all Corvette engines look pretty much alike from the outside. It is rumored that all the goodies on the inside are readily available over the counter at your local Chev shop, if you have the desire and knowledge to know what to pick out of the parts bin. Stock, man, is stock. And there are various degrees of stock. The gearbox is probably the same aluminum four-speed box that was used two years ago as there is no reason to suspect a change; the Sebring car's problems did not lie in the gears.

(Continued on page 98)

Driver Dick Thompson (left) and Zora Arkus-Duntov (right) give the author information about the car. Duntov made the understatement of the year... "It's just a cobbled-up special."

MOSS VS. FERRARI

By Steve McNamara

►On the morning of the first of September in 1951 a retired British racing driver and his 20-year-old son drove their rented car to the circuit outside Bari, a medium-size coastal city sitting on the Achilles tendon at the heel of the Italian boot. Like many days in Bari, it was very hot. On this particular day the heat became intolerable to the Englishmen, Alfred Moss and his son, Stirling, particularly in the area under their collars.

The temperature in Bari has varied during the past eight years, but the temperature under Stirling Moss' collar has remained consistently high. And although that day appears nowhere in the records of international motor racing, it has had an increasingly strong effect on the result of every important Grand Prix and sports car race in the world.

On that day Stirling Moss "practically made a vow never to drive for Ferrari."

As Stirling Moss stands clearly above his rivals as one of racing's greatest drivers, Enzo Ferrari's racing automobiles are clearly the world's best. Moss has never driven for Ferrari's team and probably never will.

The separation, now enforced only by Moss, has had a greater effect on the Briton's fortunes than those of the Commentadore. When Ferrari's sports and Grand Prix cars were beaten last season, more often than not it was by Moss. And thanks in the main to Moss, Tony Vandervell's Vanwalls won the Formula I constructor's championship despite the fact that they were considerably less powerful than the Ferraris. But the tremendous urge and reliability of Ferrari's cars plus the strong driver team he always assembles have meant dominance for the man from Modena. He has done all right without Moss.

Any driver who "renounces" Ferrari seriously cripples his chances. Ironically, Moss is hurt probably more than most; he and Ferrari automobiles seem peculiarly suited to each other.

Moss is known to some as a hard man on a car. He denies this, insisting he never abuses a car, only drives it to the limit at all times. "Let's say I'm given a new car for a race. The chief engineer and the team manager say to take it to 6,700 in the top gears and 6,500 in first. That's where the car's maximum performance is and that's where I drive it. If the engineer was wrong and the car can't take it, that's hardly my fault."

Unfortunately for Moss, very few cars, and apparently British cars in particular, can "take it" over a long haul. Ferrari's blood red machines can "take it"; the phenomenal durability of their engines is their chief virtue.

With the exception of the 1955 season with Mercedes-Benz, Moss' demanding driving has never had the full benefit of really tough machinery. Last season, for example, he drove Aston-Martin sports cars, with their chronically ill gear boxes, and GP Vanwalls, which had digestion problems right after the FIA-ruled switch from alcohol mixture to aviation fuel. The record book tells the tale: lap marks on nearly every circuit (including the surpassing of Fangio's "ultimate" mark at the Nurburgring) and almost always victory when he finished, but a long list of retirements. He won four Grand Epeuves to Mike Hawthorn's one. Only at the Grand Prix of France did he finish second to Hawthorn. The other times he just didn't finish—and Hawthorn, on Ferrari, won the world championship by one point.

This season might be equally frustrating. Mercedes-Benz and Maserati aren't racing. Tony Vandervell will run one car, with Moss up. Aston-Martin has entered the Formula I fray, but it would be a

motor racing miracle if its first effort weren't full of bugs. The BRM's are back again but that noble effort seems synonymous with unreliability. The Scarabs are both untried and spoken for. So Moss probably will campaign most of the season with the Vanwall, and Rob Walker's Cooper-BRM, a hybrid full of possibilities but most definitely an underdog to Ferrari's new creations. If the new Cooper sports lives up to its promise, Moss' two-seater season could be quite cheerful, but again, Ferrari's proven superiority in sports cars is even more convincing than in GP machines.

Moss summed up the situation neatly when we asked him how he felt about a season of free-lancing: "It's more worry, I guess. But I've always said that really one should use a different car for each circuit —unless you've got a Ferrari. A Ferrari drives all right everywhere. As much as I disagree with Ferrari's past behaviour, I have to admire him for his cars. He has the best cars in the world. There are no two ways about it."

Moss finds it difficult to refer to Enzo Ferrari without adding a few choice Anglo-Saxon modifiers, but there is no doubt he gets along well with Ferrari iron. Those who question this rapport should examine the results of three sports car races: the 1957 Nassau Speed Week Governor's Trophy and Tourist Trophy races and the abortive 1958 Gran Premio de Cuba. These were Moss' three races on Ferrari. He won all three.

Circumstances forced Moss to declare a truce of sorts with Ferrari and drive privately-owned cars on those occasions. But it's unlikely to happen again very soon, if ever.

Why? Why will racing's best driver not drive for its best car builder? For Sports Cars Illustrated, Moss explains fully for the first time why he refuses to drive for Enzo Ferrari:

"He let me down when I was nobody. He didn't need me then and he treated me very badly. I feel very strongly about it."I reckon it started on July 1st, 1951. (In 1950 Moss had won the first of his eight British championships.) I was at the Avus circuit (in Germany) with John Heath's HWM team. A cable came from the Ferrari factory asking me to drive a Formula I car in a race at Rheims. The race was the same day as Avus, or maybe it was the next day after; anyway, I replied that I had to race at Avus because I had a contract with HWM.

"On August 10th I was with HWM at Erlen (near Zurich) when I got another cable from the Ferrari factory, from Marzotto, asking if I was interested in driving a 1.5 car. Again I said I couldn't because of my HWM contract. The next day I got a cable from Ferrari himself asking me to drive for him at Bari. Of course I was very excited. After the race I drove down to Modena in my Morris and talked to Ferrari. We got along quite well. I didn't speak Italian then and he can't speak English but we went at it in some rather wild French.

"He made several offers. He asked me to drive the new four cylinder, 2.5 car at Bari if it was ready in time and definitely to drive it at Monza. He wanted me to go with Ascari and Villoresi that winter for seven races in South America and he asked me to drive for him exclusively the next season (1952).

"I said only that I would drive the new car at Bari if HWM didn't go. And I said I couldn't drive both GP and sports for him the next season because I had a sports contract with Jaguar. That was the only time I've ever talked to Ferrari. On the way back from Modena I saw the HWM people and found out they had decided not to go to Bari. It looked like my first go in a foreign car.

(Moss, or "Steerling Moose" as they called him, was very popular with the Italians. The charging young Briton was clasped to the Latin heart when at Monza the year before he pushed his disabled car across the finish line.)

"After I got back home, the Auto Club of Bari, they were running the race, offered me quite a large sum for starting money. I said I couldn't get a British car and they replied they would see to it that I got a new car, a Ferrari. Now I had it from both Ferrari and the Auto Club.

"On August 29 I flew down to Rome with my father. We walked around and went to a film that night, it was one of those Westerns I think. The next evening we took a sleeper to Bari. At least they claimed it was a sleeper. It was damn hot and stuffy and there was no place to sleep. Finally I threw open the window. As it happened we were passing through a tunnel and smoke and cinders came pouring in the carriage.

"The next day we rented a car and drove out to the circuit. It was the day before practice and nobody was about, but I saw my car. I knew it was my car because it was the only one with four cylinders. We looked it over and drove back to town."

"On the first morning of practice, that was September 1st, we drove out to the circuit. I assumed everything was fine as the Auto Club had promised me a new Ferrari, Ferrari himself had told me I could have the new car if it was ready and I had seen that it was ready.

"I walked into the garage to get the car and the team manager said there would be no car, it had been given to Mr. Taruffi, period. There was no apology or explanation whatsoever. They didn't try to contact me before I left home or even when I got to Bari. They waited until practice and all they said was, 'There will be no car. It has been given to Mr. Taruffi.' I never sat in the car. Right then I practically made a vow never to drive for Ferrari."

(Moss did drive a Ferrari that day and it only deepened his dark mood. David Murray offered Moss his 2-liter machine with the accelerator pedal in the center. On the first turn Moss slammed his foot on the go pedal instead of the stop and hit a tree. He hasn't driven a car with a center accelerator since.)

"It's not so much that I didn't get to drive the new car. I understand Ferrari was worried about Alfa coming down with a lot of cars and he wanted to go with all his team drivers. It's just the way he treated me. I guess he figured it didn't matter what he did. I'd be back around begging for a ride at the next race. He decided he could get along without me so I decided right then I would try my damndest to get along without him. I've been offered a Ferrari contract every year since. Last year I was made two offers, at Monaco and Rheims. And this last December he cabled to ask if I was interested in a contract as No. 1 driver.

"I think he already has too many experienced drivers; it doesn't help racing to have everyone in the same camp. Now that they've signed Tony (Brooks), Phil (Hill) and Jean (Bhera) they've got the most powerful team ever. When one team has every good driver it isn't racing. The team manager can decide who wins."

(Moss is, above all, a fighter. As much as he likes to win he doesn't mind the role of permanent underdog. Victory is so much sweeter when it comes over Sr. Ferrari. Another factor influencing Moss' anti-Ferrari position is his burning desire to win the world championship in a British car. Always his chief ambition, it became even more important when Hawthorn slipped in as the first British world champion.)

"Will I ever drive for Ferrari? Maybe, but I feel that we shall have to have a long talk first, so that our differences can be settled. I'd like to because his cars are so good. I did drive at Nassau and Cuba. I wouldn't have, but at Nassau my car (an Aston-Martin DBR3) was wrecked in the Ladies' Race. I was obligated to drive and there was no other car but a Ferrari. And they changed the accelerator over from the center to the right side. I tried very hard to find a Maser for Cuba but I couldn't. Everything was fine at Nassau so I thought I'd give it another go.

"Will it happen again? If I won the world championship in a British car, then I might consider it."

THEY SAID IT COULDN'T BE DONE

1

2

4

5

1. "Save your Confederate money the South will rise again."

2. End of a long journey in two surprisingly un-tired automobiles.

3. Twin cam had a 700 cruising radius with 25-gallon racing tank.

4. Everything South of the Mason-Dixon line is historic.

5. Take heart! The word about cars that go and handle is spreading.

Ocee Ritch writes a "Dear John" letter.

Los Angeles, April 1

John Christy,
Editor, SPORTS CARS ILLUSTRATED
1 Park Ave.,
New York, N. Y.

Dear John:

When we shook hands and parted at Avon Park, Florida, I'm sure you noted the slight tremble in my limbs and I appreciated the extra emphasis you gave to the conventional "good luck" as you mumbled a farewell. The thought that you were actually participating in a scheme where an old friend, such as myself, would attempt to drive a car across the continent that YOU had raced for 12 hours must have weighed heavily on your conscience. Of course, I had only myself to blame, I couldn't even put the onus on Tony Birt of Hambro who usually thinks up these things . . . but I thought you'd like to know that everything came out all right and that you can now uncross your fingers.

The readers of SCI to whom you brought the stirring tale of Sebring and your not inconsequential part in it will never know the backstage (or behind-the-pit) drama that was played around the MGA and Sprite team cars. Nor will they ever be aware that two of the sturdy entrants (cars, not drivers) were fired up after the big event and driven, virtually untouched, through rain, heat and gloom of night all the way to Los Angeles.

Charlie Weber and I flew to Sebring this year with the express intention of enjoying ourselves and with no ulterior motive, such as writing a story about the race (1,500 other press people took care of that). So, knowing that we would otherwise be having a good time and with no responsibility, Bill Pringle of Gough Industries (BMC distributors in LA) called one day and said,

"I say, old Bean, you won't have anything to do at Sebring, how about seeing that our cars get shipped home properly?" It seems that Gough had purchased a Sprite and an MGA to be delivered after the race. Pringle, as Service Manager, was scheduled to make the trip but last minute events canceled the bit.

"All right, Bill," I said agreeably, "what do I do?"

"Oh, just pop the little bears onto a transport or a flatbed that's coming this way and insure them heavily."

"What could be simpler?" I asked, rhetorically.

"Nothing," Bill murmured, "just be sure you get two that have the least body damage. Those oil drums at Sebring leave nasty dents."

"Right, ho!" I imitated his Aussie accent, "leave it to me. I'll get the best of the lot."

Fatal words.

All during the cattle flight we took by mistake and during the dismal practice sessions under a Confederate blanket-colored sky the admonition to seize the best surviving cars from the teams bounced around my brain like a ping pong ball. I buttonholed the drivers under the pretense of learning more about driving techniques and tried to determine which pairs were the most conservative. Mechanics fell under my eagle-eyed scrutiny and, after posting Charlie on the details of the plot so he could help judge, we made careful notes on which cars got the most tender loving care. During practice we timed the different vehicles, rushed back to the pits to see why each was called in and kept a detailed log on performance.

During the race, of course, we were pretty busy just taking in all the sights and sounds but we managed to keep close tabs on the A's and the Sprites as they purred along. #30 MGA eliminated itself from my book when it took a rock through the sump but the others and the miniature Healeys looked so stout that an idea began to form as the race progressed.

"Charley," I said cautiously, "why don't we just *drive* a couple of these cars back to the Coast?"

"Why not?" Charlie answered with a sidelong look, "they should be well broken in after this."

Marcus Chambers, Healey team manager, was less sanguine. "Why, the cars will finish in great shape, I've no doubt, but Los Angeles is a jolly good bit off, isn't it?"

"Three thousand jolly miles," I stated.

"Hm. Here, try a bit of my Latakia. I don't see how you Americans can smoke your flaky pipe tobacco."

I chewed on my pipestem. "Marcus," I said, "I must have two sound automobiles to drive back. Can't you give Christy the Slow Down signal? He's going entirely too fast."

On Sunday morning after the race we gathered at BMC headquarters in Avon Park, a few miles north of Sebring, to celebrate the fine performance of the teams and to say farewell all around. By noon Charlie and I had been in, under, over and around the cars with notebook and pencil and, retiring to a nearby *bierstube,* for privacy we correlated driver impressions, points earned by various mechanics for neatness and devotion to duty, practice times, race performance, laps covered, average speeds and causes for pit stops, and made a final decision on exactly which of the bolides we would select.

As we were gathering our materials to depart, one of the BMC officials came up with Jack Flaherty in tow.

"I say, chaps, Jack here is to pick up a couple of cars too, why don't we toss a coin to see who gets which ones?"

Jolly!

So it was that at One O'clock on Sunday that we took posession of #55 Sprite (Ex Hayes/Christy) and #29 MGA Twin Cam Coupe. The Sprite had a weak fuel pump and a broken exhaust manifold downpipe plus a jury-rigged throttle bracket. The A was immaculate.

Back to Sebring, after replacing the fuel pump points, then to our lodgings where we made use of the tools and welding skill of Bill Love (whose AC Bristol had stayed on the Alternate list) to render the Sprite whole. On Monday, we shook the mud of Sebring from our boots and stormed off on the 3,000 mile road test.

Neither Charlie nor I had driven the cars previously, of course, so our first couple of hours were spent in getting used to the machinery. Right hand drive was not strange to either of us, but we had forgotten how easy it is to shake up truck drivers with this type of steering arrangement. All you do is approach closely behind the rig and gradually edge out so that just the left side of your car is visible in the trucker's rear view mirror. Then he can see there's nobody driving the funny little car behind him.

Sport!

The experience of driving a sports car in a race such as the 12 hour grind is not to be compared with putting the same mileage on during a cross country jaunt. There are always new situations on the highway and many opportunities to assay braking, acceleration and handling under varied conditions. For instance: The highway up the west coast of Florida looks nearly as smooth as the blacktop at Sebring but, cleverly concealed by a sadistic Highway Department, there are undulations and transverse ridges which would do credit to a proving ground. After traversing a hundred miles or so of this washboard, we called a rest stop to let our eyeballs settle in their sockets.

"You know," Charlie said, "we ought to put some soap and water in the rear deck space and do our laundry."

With the extra stiffness in the front suspension on the Sprite, it is easy to see why Charlie chewed through two pipe stems in a half day on this stretch. At 70 mph, indicated, (my tach had left me within 10 miles after getting underway) on this surface, the Sprite appeared to be a handful to hold in a straight line. The A, on the other hand, soaked up the pounding pretty well and only the inherent tight shock setting caused any discomfort. Actually I preferred the short, quick jolts to the slow-motion elephantine wallowing we could observe in the conventional cars we met and passed.

Once we left this piece of paving, we barrelled into Mobile, Alabama in style. At the end of our first day we were not

(Continued on page 93)

SCI DRIVER'S REPORT

FIAT MULTIPLA

with multiplied power

ALTHOUGH we haven't had the opportunity to test-drive the Goggomobil, it appears that we are nearing the ultimate in small displacement automobiles with the Fiat 600. And, when the vehicle under scrutiny is a six-passenger "bus" powered by a 633 cc (38 cubic inch) engine, one begins to wonder what legerdemain the engineers are using to achieve the results brought out by our comprehensive trial. The Fiat Multipla becomes interesting to the autophile simply because it demonstrates that comfort, roadability and utility are not necessarily functions of size.

Most of us felt at one time that the VW Kombis represented about the smallest package practical for the American scene; but we have become accustomed to the Goliath Station Wagon, and are now confronted with the Multipla. So it appears that our opinions must undergo constant realignment, such as, perhaps, testing the Eshleman.

When Charles and Marion Weber returned from Italy, they mentioned that one of their purchases had been a 4-door "station wagon" with a 79 inch wheelbase. After our first reaction — disbelief, we put in a bid to run the car through a trial for the readers of SCI. Permission was granted, and when the little Multipla was delivered we helped with the breaking-in routine and eventually wrung it out for performance. It is believed that this was the first Multipla brought to these shores; but now its main distinction, since Hoffman is well stocked, is that it is the only "hopped-up" 600 Multipla in the country. Before having it consigned, the Webers specified that the factory ship the car to Nardi & Co. for engine modifications deemed suitable. We shall examine these alterations and their effects later on.

Our reaction on seeing the Multipla for the first time was that without a comparison vehicle it appears normal in size. Now, to a Porsche owner, this is not unusual, but we had a similar opinion expressed by several observers.

Placed alongside a normal "small car", such the VW, Dauphine or Borgward, however, its dimunitive scale becomes apparent. The illusion of greater size is due to good proportioning. No standard parts which would appear out of scale have been used and, from the 12" wheels to the tiny sealed-beam headlight units everything is in Lilliputian order. Every detail of manufacture and trim, too, is as well balanced as the inherent design with the overall result that the car appears "expensive." The most often heard comment from people in the automobile business was: "this isn't cheap". The Multipla comes equipped with an efficient heater-defroster, turn indicators, two sunvisors and twin wipers and interior courtesy light as standard.

To deliberately make a small car without searching for every cost-cutting angle, then, must have a purpose. Undoubtedly, the Fiat 600 Multipla fills a definite need in Italy where the roads are choked with them, according to the Webers, but to what extent it will find a niche in this country is problematical. Let's examine it in some detail and see if we can reach any conclusions.

The Multipla is a rear-engined utility-bus offering either seating for up to six or a load plattorm of 19 sq. ft. It can carry 770 lbs. plus driver. As a six-seater, it has a front bench seat and four individual seats whose fold-down backs make them reminiscent of the extra seats in taxis. As a matter of fact, Multiplas so equipped are used as taxis in Europe, but everyone questioned on this point here felt that they would never get off the ground with the Yellow Cab. Co. In the more common version, the second seat is also a bench which folds neatly to make a floor-platform like a regular station wagon. In the "up" position, there is a luggage space of generous proportions behind the seat. When both seats are folded with the padded side up a sleeping-platform is developed for emergency naps.

Both front and rear doors swing wide and part of each front door is cut away to form the top portion of the wheel well. The front seat is directly over the independently sprung front wheels and the articulated steering column comes back from the dash and downward between the driver's legs. Pedals are well placed and of good size. The instrument cluster is hooded in the approved position above the steering column and visibility of instruments and the road is excellent. A four-speed shift lever is conveniently placed on the floor and, somewhat unusual but handy, the starter and choke controls are on the floor behind the lever. The hand brake is to the right of this grouping.

A multiple-position switch in the center of the dash controls ignition and parking lights, plus low and high beams on the headlights, otherwise little familiarization is necessary prior to getting under way.

A twelve-volt electrical system is used, so the powerful starter really spins the quiet-running 4-cylinder engine and it fired right up at every asking . . . including some relatively cold Southern California mornings. A unique feature on the air cleaner helped warm-ups on such occasions. The air intake duct has a two-position baffle which directs warm air from around the exhaust manifold or normal air from the engine compartment depending on a manual setting. Under cold-start conditions the first position is used until the engine reaches operating temperature at which time it can be changed with little effort. There is a pronounced difference in performance after the 22-HP powerplant has been thoroughly warmed up on the road because of the drag of low-temperature oils and greases in the drive train. One becomes acutely conscious of such tiny items in a marginally powered vehicle, it seems.

The OHV pushrod engine with bore and stroke of 60 x 56 mm develops its 22 HP at 4,600 RPM in stock form. Compression ratio is 7:1 which makes it practical to use "regular" grades of gasoline.

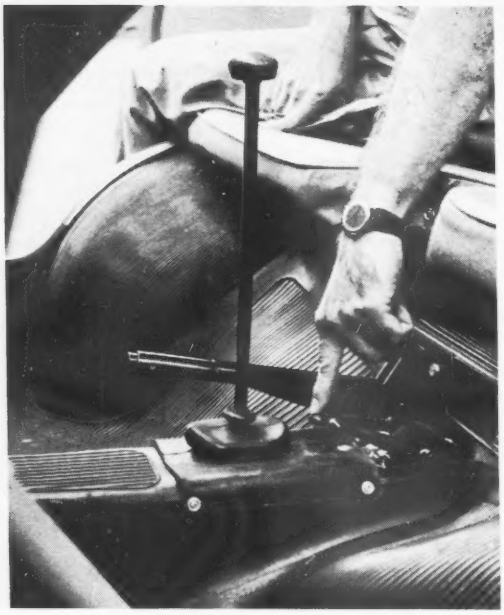
But because the Webers' Multipla boasts 8:1 compression after Nardi's alterations we used ethyl fuel. Mileage for city driving averaged 39 mpg, hard driving: 36.5, and cruising at 50 mph, unloaded, on the highway as high as 42.

With a curbside weight of 1,625 lbs., including a full tank (7.5 gallons) of gas, the Multipla presents a man-sized load for the 22 horses to push and the gearing is as might be expected: 21-1, 13-1, 8-1 and 5.38-1 for the four gears with the top three syncromesh. This is considerably lower than the 600 sedan, which performs rather acceptably and the Webers felt that some provision should be made to keep up with freeway traffic so Nardi was entrusted to add the maximum amount of soup consistent with everday driving. The raised compression has been mentioned, in addition a set of "headers", individual exhaust pipes, were added and directed into dual mufflers. The intake and exhaust ports were polished and matched to the manifolds and the carburetor was re-jetted and the pump stroke increased. (Total charge for labor, by the way was $45.00!) That these alterations were well worth the investment was proven by comparing our performance figures with those of *The Autocar* and *The Motor,* British magazines which ran similar tests.

Driving the Multipla is a real kick. Its small size and quick 3⅛ turn steering, combined with the out-in-front driver's position makes traffic a game. One can take advantage of openings, narrow lanes and other drivers in a manner not possible with any other car and, in all fairness to the utility this may be the greatest value of the bus. I was unable to keep sight of Mr. Weber in the Multipla while following him through downtown traffic in my 190SL. He simply darted through a few openings and left me at a stop light.

Acceleration is no boot-in-the back, but we turned the standing quarter in 26.5 seconds (one-way run only) and achieved 0-40 in 20 sec., 0-50 in 39.4. Actually, the time between 40 and 50 MPH can be improved by winding the little engine past the redline in third but as new as it was, we hesitated to over-rev too much.

Cutaway show wagon (above) reveals just how Fiat got so much into so little. Front and back seats (left) can be folded with padded side up to form bed platform.



Starter and choke controls (above) are lever-like arrangements mounted on the floor. Two-position baffle in air cleaner (below) directs hot air from exhaust manifold to carburetor during cold weather.

Use of scaled-down door handles, lights, wheels, etc. makes the Multipla look bigger than it really is.

The comparative figures from *The Motor* were 0-50 in 43.0 seconds and *Autocar* took 50.7 seconds to achieve the same speed. Driving practices, of course, enter into this variation, but there is no doubt that the increased efficiency of the engine through Nardi's alterations is responsible for some betterment of the times. Top timed speed was just a shade over 63, (as against 57 in the British reports), and a two-way average read 61.5 in almost still air. Cruising is easy at 55 to 60, but that last two or three MPH comes hard. Wind speed and direction changed slightly during our test runs and we found that the Multipla bore about the same burden as besets the VW in a breeze of any consequence except that it is not as sensitive to a direct side wind.

Handling characteristics are rated as very good. The Multipla corners flat without tire squeal and reacts surprisingly little to choppy road surfaces. The weight distribution (53.5 rear – 46.5 front) is altered to 50-50 or better by addition of a driver and passenger so that it behaves much like the Porsche. The driver's position relative to the rest of the car precludes any intimate feeling, such as is experienced with, say the Porsche, but the sensation of complete control over road action is nonetheless present. It is highly doubtful that anyone could drive the Multipla into trouble on the normal highway. Its hydraulically operated brakes are superb, with finned 8.7" drums measuring 1.85" in width. This gives a generous lining area per laden ton.
In repeated panic stops the brakes showed little fade and 50 pounds of pedal pressure gave deceleration of about ¾ g.

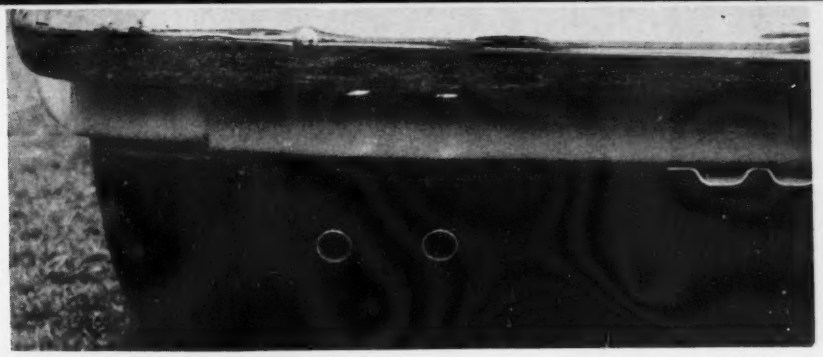
In looking at the 600 from a service angle, it would appear to be relatively trouble-free from the outset and easy to get at for most common adjustments and repairs. The engine-transmission-differential unit is mounted much like the Renault and everything above the sump is accessible through the deck lid which raises completely out of the way. Distributor, dip stick, carburetor, fuel pump and spark plugs are in plain sight and require no awkward positions or special tools.

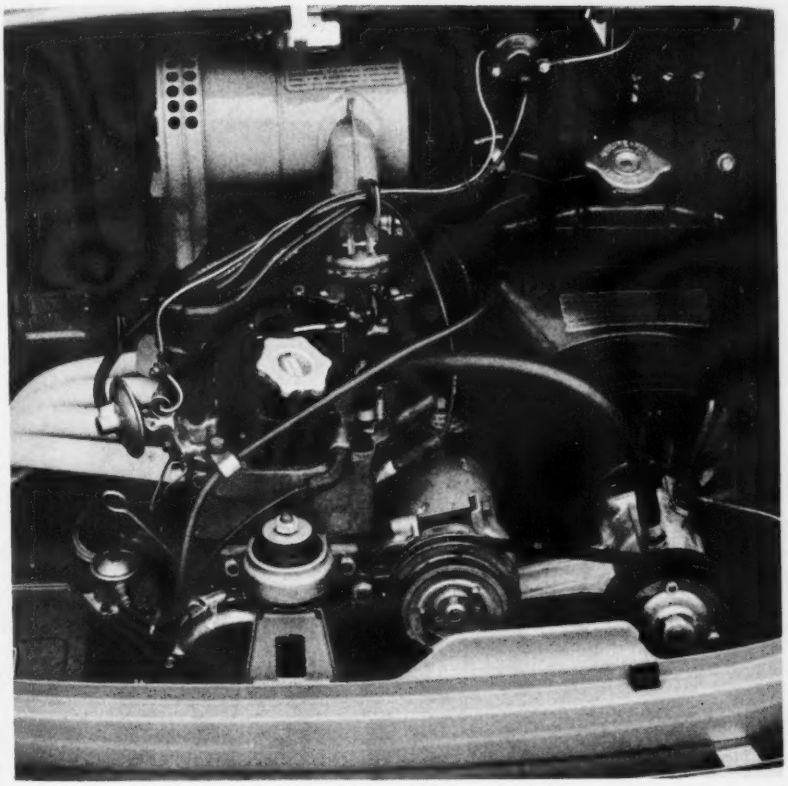
The radiator, which uses forced air draft from a shrouded fan, is placed alongside the engine and its 1½ gallon capacity seems adequate for average conditions. The only complaint registered so far by a mechanic was that it is necessary to remove the carburetor, linkage and ignition wiring to get the valve cover off. This makes tappet adjustments more of a chore than should be strictly necessary.

Rear seat passengers (many, and up to 3 at a time) all declared that the ride was far better than expected, and that it compared well with much larger cars. The typical chop of the short wheelbase auto is not noticed in the Multipla, probably because of the long spring rate of the coils. However, as the main cargo of this and many other Multiplas will be goods rather than people, this is largely academic. To the driver, the seating position over the front wheel makes for a bouncy but not tiring trip, and a day of wheeling one around town is much less exhausting than wrestling an ordinary van. Loading through the 30" wide side doors is simple and, unless extreme bulk is encountered, the 38 x 47 x 48 inch cargo area should be adequate for light delivery purposes. Parts houses, drug stores, florists, and others whose products are neither extremely heavy nor outsize should find the Multipla useful.

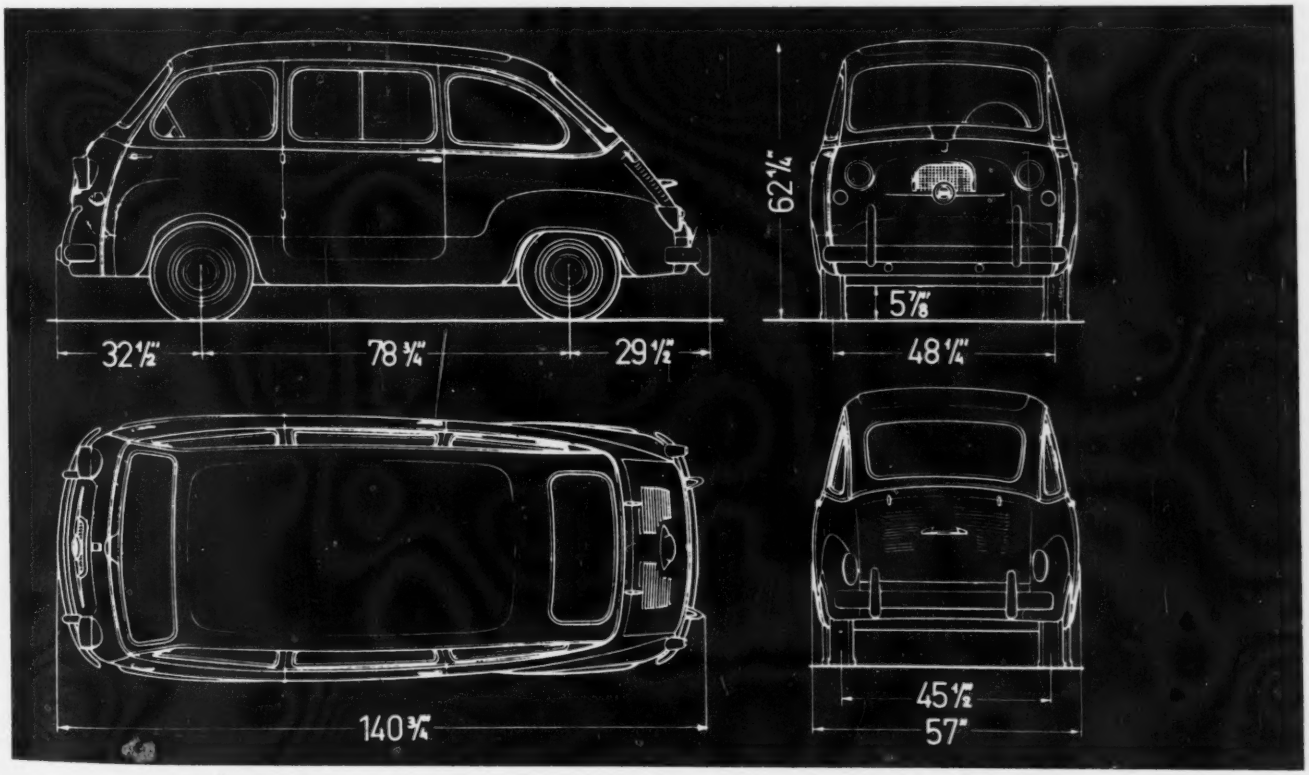
Although we wouldn't choose one for a New York-L. A. trip, we feel that the Multipla is more than adequate for the missions that most of them will be called upon to fulfill. With 40 MPG economy on regular fuel and real agility in traffic, one mission may be to replace tired station wagons now favored by some two-car families. A mother with a busload of youngsters should certainly find parking and maneuvering one of these babies far more rewarding than conning one of the 20 foot long "low price three" around the village.

Who knows, it may even become fashionable to have the smallest car.





Twin exhaust pipes (top) from dual mufflers indicate that all is not stock under the stern. Nardi headers (left) are part of complete speed package for Fiat 600 engine that boosts output some 15%. Italians like to drive, ergo anything built in Italy corners well.



LE MANS MELANGE

From Galahaddery to low comedy, the Sarthe story has something of everything.

Stutz vs. Blower Bentley, the Bentley leading, in the 1930 race. The Stutz retired allowing the Bentleys to finish first and second.

By Dennis May

►Luckily for co-drivers Joan Richmond and Ken Bilney, the commissaire conning their Le Mans pit didn't notice Joan had apparently grown a mustache and developed a growling bass between 9 and 10:30 a.m. on June 20, 1937. *We* know, of course, she was still the same smooth complexioned soprano she had always been, but it's easy to be smart twenty-two years after the event. Back of the enigma was the only recorded instance of a *third* driver drafting himself onto a lawfully constituted twosome crew at Le Mans in mid-race, incognito. Ruling the waves or waiving the rules, either came naturally to Britannia.

This is what happened:—

During one of Joan Richmond's duty spells on No. 42, a small British Ford, a rainstorm doused the ignition. When it failed to respond to her usual cure for electrical ills, viz., kicking the battery a few times, she abandoned the car on the far side of the circuit, walked to the pits, and turned the problem over to the entry's general factotum, Jock Horsfall. Jock repeated Joan's hike in reverse, dried out the sparks on location, then committed a dire and unprecedented malfeasance: he drove the car in, as bold as brass. The attendant commissaire, normally as sharp as a gimlet, had momentarily gone off into a brown study. "So we all ran around in circles and mixed ourselves up", as Horsfall told it years later, "and before he'd recovered conciousness you couldn't tell who the hell was who".

No. 42, restored to its rightful chauffeuse, went on to finish and place second in its class. Having made up all-time's only *menage à trois* at Le Mans, Jock Horsfall later became one of the few British qualifiers for the First Person Singular Club in 24-hour races. At Spa on July 9/10, 1949, he went twice around the clock at the wheel of his own 2-litre Aston Martin, averaging 76 mph to yawn into fourth place on general classification. He was killed at Silverstone a month later. Ken Bilney lost his life in Sebring's English prototype, the Donington 12-Hours, a few weeks after his first and last Le Mans in '37.

But in the Le Mans context, as elsewhere, it is the French who truly excel in devising complicated ways of beating complicated rules. Horsfall's method of saving his crew an hour, spontaneous and artless as it was, would never have occurred to a Frenchman. The Gallic mind prefers subtler contraventions, like slipping a driver an illicit spark plug stuffed into a banana, or a valve spring in a sandwich, so he can change the thing in privacy out on the course. Collectively, these wiles and stratagems are known among French *pilotes* and race mechanics as the D-System: nobody thinks any the worse of you for practising it, the only sin is getting found out.

Giraud-Cabantous' pitmen, for instance, were desolate at the exposure of a ruse they tried on his behalf in the 1931 *Vingt-Quatre Heures*. It was raining when he inadvertently moled his Caban into a sandbank at Tertre Rouge and stuck there; so, with comradely solicitude, they sent out a stooge on foot with a mackintosh for him. An official intercepted and confiscated the coat, afterwards inviting the senders to come and retrieve it. Red to the ears, they declined, thereby losing not only a perfectly good mac but also the shovel they'd wrapped in it.

Simplified in the course of years, the Le Mans regulations were at one time so abstruse and involved that they virtually carried their own built-in insurance against *supercherie, escamotrie, suppressio veri,* and stuff like that. You couldn't outsmart them because they defied interpretation. Apropos, the *Autocar's* report of the 1924 race said "competitors and officials alike admitted they could not understand the complicated rules . . . some of the best engineers in France confessed they were completely puzzled". The winners, Duff and Clement on the former's 3-litre Bentley, were officially credited with a distance of 1290.75 miles, but all were agreed they actually went at least a hundred miles further than this. For reasons that never penetrated Duff's head, his last ninety minutes running was discounted, though he'd been driving like the hubs of hell in the belief he was losing the race.

The previous year, 1923, which was when it all started, the *Motor* excusably failed to deduce the contest was a race, and kept calling it a trial.

Although the early Le Mans races were strictly for stock passenger cars, it didn't take long for a deviationist movement to get going. In 1924, Chenard-Walcker were saving weight by "paneling" their bodies in calico. The result, painted blue, reportedly "looked like a real body at a distance", which must presumably have been the range it was scrutineered at. Mercedes, incidentally, were about three decades behind the Le Mans times with desmodromic valves on the 300SLR; the 2-litre Bignan that placed second in 1923 featured this holiday-for-springs system.

Le Mans history abounds in *perfer et obdura* tales, not all of them as oft-told as the Bentley team's crash episode at White House in 1927, which we guarantee not to repeat here. In 1928 the race was won by a car that had been provisionally retired, and pushed partway to the morgue, sixteen hours earlier. In '35, one of the winning Lagonda's co-drivers had abandoned the car out in the country, walked in, and was searching the phrasebook for the French for "We quit" when a Lag mechanic forestalled him with a lecturette on first-aid for Lagonda gearboxes. The 2-litre Aston Martin that was to win the Biennial Cup in 1937 was officially announced as a retirement some hours before the finish. All that ailed it was a decapi-

1. Godrivers Raymond Sommer (at wheel) and Tazio Nuvolari after winning in 1933 by 0.249 miles.

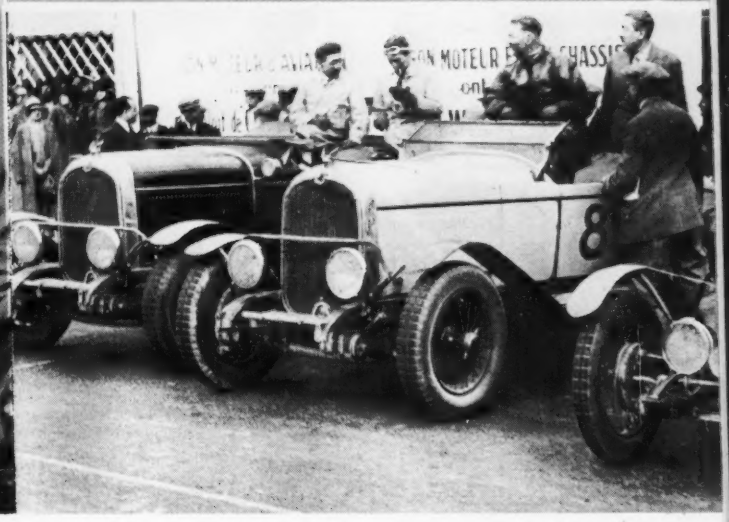
2. The four year reign of the Alfas was initiated in 1931 by British drivers Earl Howe and Tim Birkin.

3. Just Vernet (left) and Port Hault. Vernet raced at Le Mans at least thirteen times.

4. Contrary to popular belief the Cuningham Cadillacs were not the first American cars to compete at Le Mans. In 1928, fairly stock Chryslers gave it the old college try.

2

3



4

tated valve that went up and down with the piston rather than the rocker; the off-duty driver, with what breath he had left after a four-mile jogtrot to the scene of the contretemps, managed to convince his partner that a little thing like this needn't stop them winning on handicap, and it didn't.

Eugene Chaboud and Jean Tremoulet were paired on the ultimately victorious Delahaye in 1938, and their troubles started before the race had even begun. Around 3 o'clock on the Saturday afternoon they discovered their fuel tank was leaking badly, so they bodged it with soap. In the course of the evening the Delahaye's gears went serially on strike, starting with low and working up. Around midnight, with only top gear left, Tremoulet pulled out and told his pitmen he was retiring the car. When Chaboud heard of this unilateral decision he blew his cork, gave Tremoulet three seconds to get going again, with the alternative of a forced takeover in the middle of Tremoulet's stint.

Tremoulet, who wasn't really short on guts (he was to die in a motorcycle crash while on Resistance business during WW2), got back aboard and pressed on. For the rest of the night and clear through Sunday the Delahaye stayed in the only gear it possessed, top. Sometime on Sunday it lost its fuel filler cap, complete with official seals, which would have been unanswerable grounds for disqualification if the Automobile Club de l'Ouest had known about it. On Judgment Day I suppose every 1938 finisher will shift up one place and Chaboud/Tremoulet will topple off the top of the results table.

Just ten years earlier, in 1928, Edouard Brisson and Robert Bloch had likewise suffered an excrusiating famine of cogs, albeit a briefer one, when their black Stutz lost top gear an hour and a half from the finish. Only having had three speeds in the first place, the Stutz was killingly undergeared for cruising in second, and from minute to minute everyone expected it to start vomiting conrods. It didn't, though. Brisson and Block finally placed second, less than eight miles behind the winning 4½ Bentley. This was easily the best Le Mans yet for American cars, which finished second, third, fourth (Stutz, Chrysler, Chrysler). Before losing the most vital *vitesse* in his *boite*, Brisson had repeatedly traded the lead and the lap record with the Bentley boys.

French sport spectators are of course renowned for passionate partisanship, and they don't mince words, or even actions, when riled in behalf of a French participant. At least twice at Le Mans A.C.O. officials have had to bolt into their burrows to escape physical violence from the public, following the penalisation of popular drivers. Once was in 1926, after a crew of native idols, André Boillot and Louis Rigal, were disqualified while lying second at halftime because their Peugeot's windscreen frame broke. Another ugly scene greeted the countdown of Pozzi and Flahaut in '50, on account of lost radiator seals. There was, however, something the booing and fist-shaking multitude didn't know: apart from the absence of seals, the Delahaye's cooling system contained Vichy Water . . . and they wouldn't have put *that* in at the pit, would they?

Alone-I-dunnit drives, which rightly aren't permitted today, had a surefire appeal to stamina-loving audiences at Le Mans in days gone by. By the same token they love a familiar face and always had a soft spot for Veteran Just Vernet, who set a personal record by racing under A.C.O. auspices thirteen times, or maybe it was fourteen.

Stout and bald, Englishman Eddie Hall was well into middle age when he joined the First Person Singular Club in 1950, driving his prewar Bentley into eighth place without benefit of co-driver; and incidentally was reproved for this act of stoicism in the British automotive press. The late Louis Rosier, who won for Talbot the same year (with a black eye as a memento of a barn owl that had flown into and through his windshield) drove for 23¾ hours out of the twenty-four, turning the first-ever lap at over 100 mph and subsisting on a rather meager ration of two bananas. His son, Jean-Louis, filled in for the odd fifteen minutes.

Raymond Sommer, who was killed on a

(Continued on page 86)

"It's sweeping the country—there are 42 manufacturers already and we're working two shifts trying to fill the orders. From all we can gather there are twenty thousand ready to roll when warm weather comes if you include the home-built karts."

This was Spence Murray, former auto editor, now with Go-Kart Manufacturing Company talking. "There's nothing quite like it," he continued. We could believe him. We'd already tried karting.

A year and a half ago, we'd seen our first kart, or rather pictures thereof, in the pages of Spence's pocket sized magazine. It was kind of hard to believe. The idea of grown men putt-putting around on the equivalent of four-wheeled lawn mowers with or without blades seemed a bit ridiculous. The claim that there could be any thrill in such a rig was idiotic. Still and all, there *was* something appealing about the whole idea.

Then came the SCCA convention in St. Louis. While there we were fortunate enough to be invited out to the home of a friend on the Illinois side of the river near East St. Louis.

"You and Steve can try out the Go-Kart," said our hostess.

"Uh-huh, sure," we chorused.

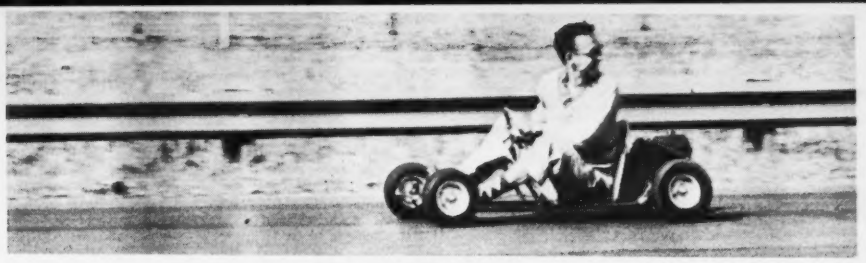
We arrived on the scene as scheduled. Suddenly we were greeted by a racket that sounded like nothing so much as a target drone airplane in full chat with the governor off. We rounded the turn into the driveway and there they were — a Go-Kart and a home-built whipping around the paved turn-around circle like a pair of berserk beetles, sliding the turns at each end in full drifts.

The two Karts came to a stop and the two full-grown drivers reluctantly if somewhat stiffly climbed off.

"Okay, boys — your turn," said our hostess. "GO!"

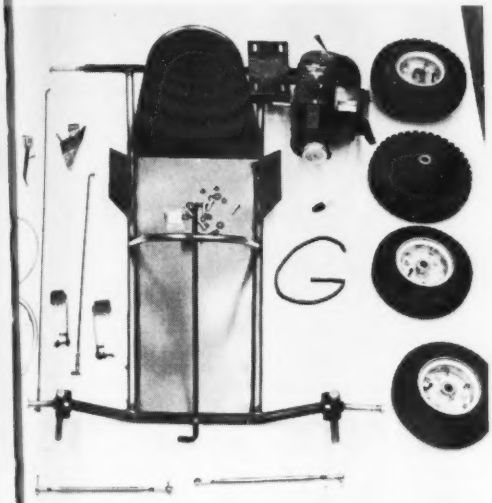
These particular Karts were clutchless, driven directly by a solid sprocket so a push start was in order. A solid shove by the erstwhile handlers and we were on our way *right now*. The initial — and expected — *putt-putt* changed almost immediately to the sharp shriek we'd heard earlier. Right about then we also discovered what really quick steering was. I thought I already knew, having had experience with track machinery with three-quarters turn lock to lock. Karts are considered to be slow steering at anything more than *one* quarter turn. Within three seemingly sizzling laps we both felt as if our fore-arms had been broken halfway between wrist and elbow. Then we learned to relax a bit and things got better. But they never got slow. Traveling that close to the ground and that exposed gives an illusion of speed that must be felt to be appreciated. At twenty miles an hour it's exhilarating, somewhat like one's first 90 mph blast in a sports car. At thirty things get exciting and at 40 the scenery begins to blur. Some Karts will do better than 50.

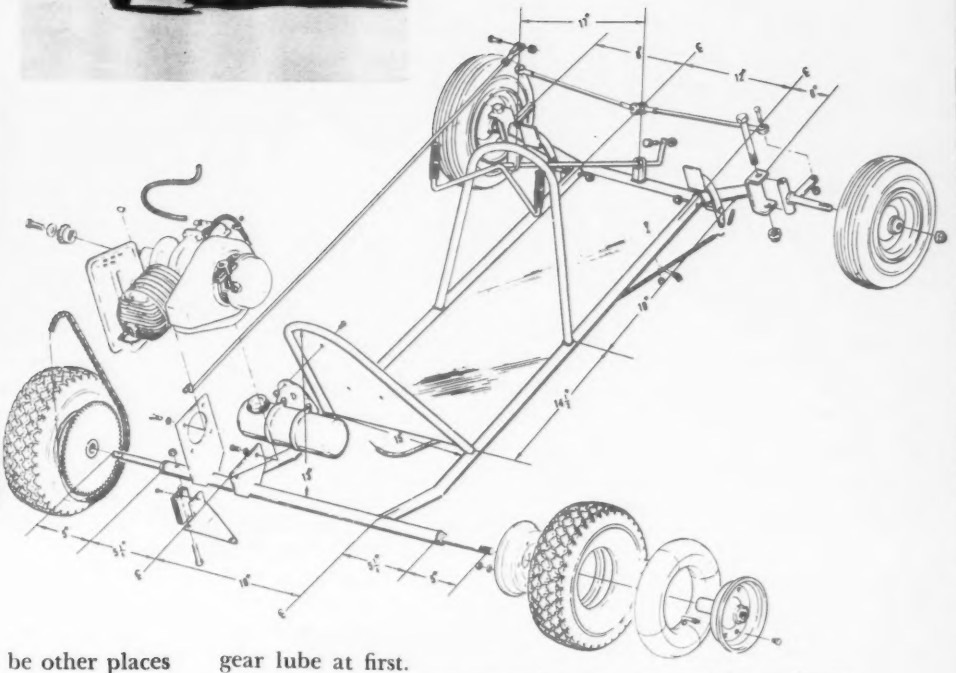
We were sold but good. Not only that but we were convinced that our readers would eat this new sport up like Hershey bars. All we had to show was (A) that Karting is pure unadulterated adult *fun* and (B) that putting a Kart together is both inexpensive and ridiculously easy. The last was simple. Where in the world is the least likely place to



Karts are for everyone—even editors (above) and race driver John Fitch (left). Schematic (below) provides proof positive that you too can build a kart. Dropped front axle is old-time hot rodders trick to help lower car's center of gravity. Kart is amazingly stable for its size.

Chassis with wheels mounted (top) just before adding power package. Installing engine consists of clinching down four bolts and mounting chain. What you see after unpacking a kart kit (if you order one with welded frame). Thin rods (left) actuate disc brakes.





put together a racing vehicle? There might be other places less likely but the one we chose was our own not-too large office on the tenth floor of an office building at One Park Avenue, New York City. The sum total of tools needed were a pair of adjustable wrenches, a screw-driver, a hammer, a pair of pliers and an electric drill. Most of this material is to be found in any office and the electric drill can be had courtesy of a building super. This is not to say that Kart-building should be part of office procedure but merely to point out that you can stuff a Kart together (if it has been previously welded) with household tools. We could have used our reasonably extensive collective tool kits and done things a shade easier but there was no need.

There are three ways of getting a Kart together. You can order a kit for a price from $124 on up, depending on the manufacturer. These usually need to have the frame welded which means you can't do it in the kitchen. Then there is the welded but unassembled Kart for about $20 more (the type of kit we used) and finally if you're in a real rush, there's the assembled and painted Kart that goes for $149 and up. These are all equipped with a single Clinton A-400 Panther which is enough for a starter, though for serious racing a plant such as a West-Bend, McCulloch, Power Products or other unit with roller bearings will be wanted. The bushing equipped Clinton will last long enough to get you into the game. You can also use a pair of them and figure they're expendable. The combination is terrific while it lasts. One thing about the Clinton — it'll run on anything. We fired ours up on rubber cement thinner and gear lube at first.

Kart handling is an art and is best learned in moderate doses. The single Clinton-engined Kart is quick enough, at least as a beginning. Ours, when we finally loaded it in a car, gave it some decent fuel and hauled it to Lime Rock did a lap at two minutes, 31 seconds which figures out to some 38 miles an hour average. The assist we got from the downhill section was cancelled to a good extent by the uphill which is short and steep. Lime Rock is a bit large for Karting, most Kart courses (Kourses, Spence??) being about half of Lime Rock's 1.5 miles in length and less than half that course's track width.

Track Director John Fitch showed up during the runs (which were sandwiched in between runs with a test car). Nothing would do but that he had to set up a short oval course with rubber cones on the straight. John is a lengthy type, standing some six feet plus but he coiled his frame into the Kart and set around the oval. The grin on his face was evidence enough that he was enjoying himself. It also proved a point. If a man who has driven Maseratis and Mercedes 300 SLR's can get a kick out of Karts it's hardly a sport for kids.

Be that as it may, our Kart is now and will be a four-alarm ball. No matter what sort of Kart you use (ours is a Go-Kart which is a trade name, *not* a generic term) you'll find that Spence was right. There's nothing quite like it.

To see what it's like and what you do when the office manager tells you to get that thing the hell out of the office, turn the page.

a kourse for karts

Now that you've got the Kart, what do you do with it aside from waking up the neighborhood?

These scenes from races at Go-Kart Raceway, Azusa, California will give you a clue. This is a true road circuit cut down to Kart size at four tenths of a mile per lap. Short or not, it still contains 11 turns split up between seven left hand and four right hand corners with one of the latter given a parabolic banking with maximum inclination of 30 degrees. The main straight is 345 feet on which the record top speed so far is 51.1 mph clocked through a trap at the end. The lap record as of this writing stands at 40.75 seconds, a piece of circuitry that Duffy Livingston, owner of the track, hasn't been able to match in his Chev-powered Eliminator Special sports car. More than one professional driver has found himself in the hay while trying to make time in a Kart on this course.

While the Azusa track may be the ultimate in Kart raceways, the sport can be partaken of an almost any large piece of pavement. It had its beginning on supermarket parking lots where most of the activity still goes on. Other possibilities are sections of existing race courses, high school cinder tracks, airport aprons and (with city fathers' permission) public parking lots where existing barriers make for interesting track layouts.

Karting is well organized with a central authority, the Go-Kart Club of America. In order to keep things down to earth, GKCA has formulated a set of rules governing Karting. The main idea is to keep costs down and to this end only two-stroke engines are allowed. These run in three classes: A — up to 5.8 cubic inches (98 cc), B — 5.81 to 11.6 cubic inches (190 cc) and C — 11.61 to 16.5 cubic inches or 270 cc. Any modifications to these plants are permitted and any fuel mixture can be used since so little is consumed the cost is low. No sort of transmission or gearbox is permitted although a clutching device is legal.

Wheelbase may be anything between 40 and 50 inches with minimum track set at one half the wheelbase measurement. Maximum height is 24 inches not counting roll bar if one is used. Wheels can be either the six inch units supplied with most Karts or the larger eight-inch Quarter midget units. Fuel-feed must be by foot throttle and brakes must be on both rear wheels for the B and C Karts, one being considered sufficient on Class A Karts — however, good brakes are a must for top performance on a Kart as well as a normal race car.

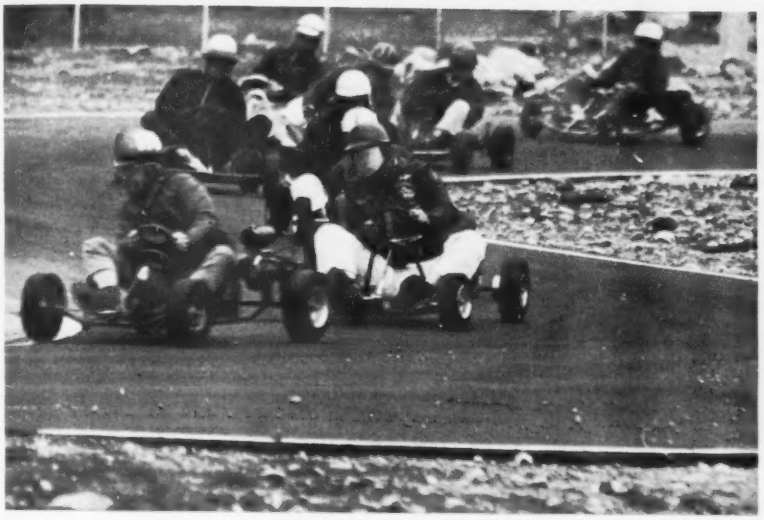
So fast has the sport gone that GKCA has already scheduled a National event at Go-Kart Raceway for July 17, 18 and 19. Entries are already coming in from as far away as the East coast and one Texas Karter is flying in a team of no less than seven Karts complete with drivers and pit crews!

If you have a hot Kart in the works, here's the time and place to prove it.

No, not living dangerously or about to flip. It's just Duffy Livingston showing what can be done by a skillful handler with a single engine kart and body english.

ABOVE & RIGHT: Spinouts happen like lightning but seldom with serious results. In most cases the driver can manhandle his kart back into action. A clutch and pull-type starter is a help in this.

LEFT & BELOW: Action at Go-Kart raceway is fast and close. This is a true road-type course with fast and slow turns in both directions. It will be the scene of a National Championship meeting.



In case the impression that karting is for kids is still extant, take a look at the gentleman above muscling a twin-engine kart through a turn at full noise. More than muscle is needed, though; quick handling karts require almost unbelievable delicacy.

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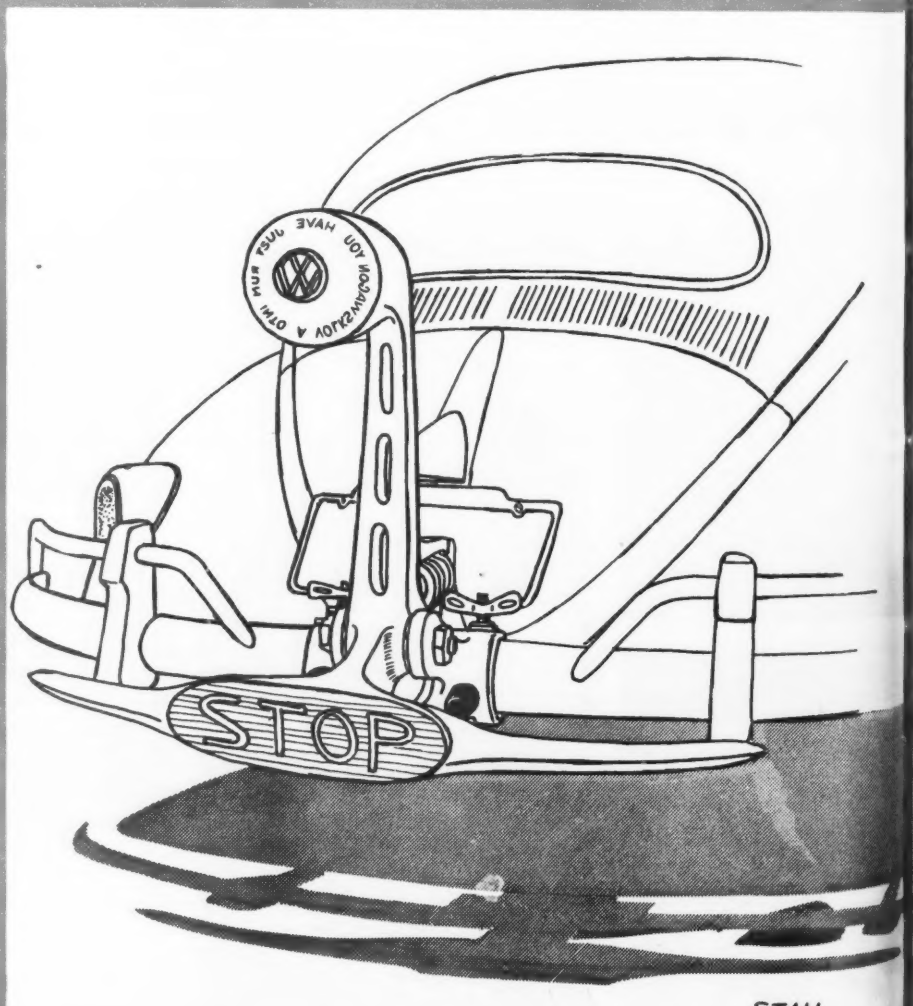

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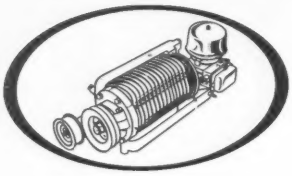

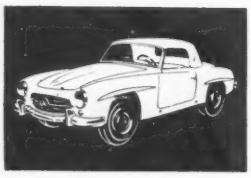

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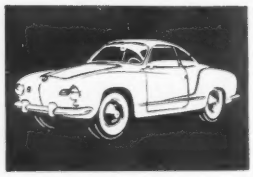

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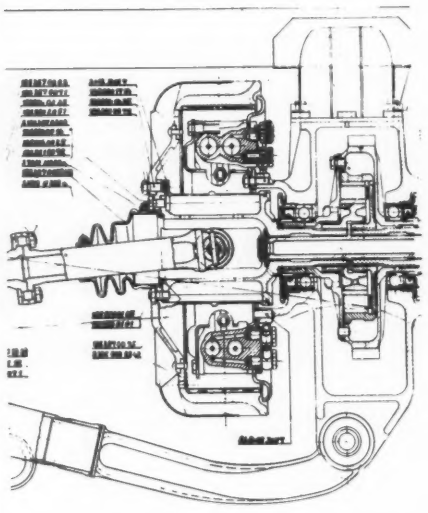
Racing Brakes

(Continued from page 39)

farther from the periphery of the back plate. On these cars Lancia introduced the practical feature of a series of slots in the backing plate which allow shoe clearance to be set with a feeler gauge. There are slots at the center and ends of each shoe, giving six in all. Lancia's drums were smaller but wider than Ferrari was accustomed to use on Formula cars, being about 330 mm in diameter.

On being given the Lancia D50's in mid-1955, Enzo had a chance to compare these two variations on a theme. He tried Lancia power in a Super Squalo chassis and fitted Squalo front brakes to a Lancia, matching them with his modified D50's. When the new Dino series first saw daylight in early 1957, it used 330 mm Ferrari-type mechanisms at the front (but with feeler gauge slots) and smaller Lancia-pattern brakes in the rear — a neat compromise. Unless extreme simplicity can be counted a drawback, these Dino mechanisms leave little to be desired.



Cross-section of rear brake of 300 SLR Mercedes shows small "wheel" cylinders used to apply force evenly to wide shoe.

The fine points that make a superb brake out of a sound basic design can be seen in the binders of the W196 Mercedes, Daimler-Benz having flattered Lampredi by choosing center-pivot shoes for their re-entry into G.P. racing. Thanks to marvelous attention to detail, it can safely be said that these were the best racing drum brakes ever built. To apply force evenly to shoes as wide as three inches, for example, two small parallel wheel cylinders attack each end of each shoe, there being eight tiny cylinders at each wheel. Also the cylinders that apply the trailing end of each shoe are slightly larger than those at the leading end, to equalize lining loads. Most ingenious dodge of all is the use of a very simple type of automatic lining clearance adjuster which keeps the brakes right on the job until the last shred of the thick (8 mm) lining is ground away. Two of these spring-loaded "follow-up" adjusters are fitted in slots near the ends of each deep, stiff shoe where they can give individual attention to the trailing and leading ends. The anchor pins for the adjusters are carried by the same big steel pressings that embrace the two pivot pins with their square bushings as well as the two quadruple-bored cylinder castings.

It must be granted that these complex and unique brakes were not light, but of course most of them were mounted as sprung weight. No special effort was made or needed to lighten the mechanisms that were installed outboard on the short and medium chassis cars; on these the shoes, cylinders, back plate, etc. weighed 11.3 pounds. With drum, one inboard brake assembly weighed about 33 pounds. With mechanism weight at less than half the total poundage, it's obvious that the *last* things to be lightened in any reducing campaign should be the necessarily-rigid shoes and backing plate. In any event Mercedes' automatic adjusters added little or no weight to their units, and gave them drum brakes that were in a class by themselves.

Low-servo systems like two-trailing-shoe (used on production cars but not yet in racing), center-pivot and spot-type disc are stable and progressive to use but can call for exhaustingly high pedal pressures. To reduce this, and at the same time prevent loss of "pedal" as the linings wear during a race, many designers have specified an external servo assist to bring engine power to bear on the problem. The low friction coefficients of linings in the early days of racing made servos very popular long before hydraulics had won acceptance. Gearbox-driven mechanical boosts were fitted to the 1920 Ballot, 1922 and 1924 Sunbeams and 1927 Delage, while Vauxhall and Fiat did with pneumatic and hydraulic assists respectively.

More recently the V16 BRM was fitted with an engine-driven hydraulic servo for the three-shoe Girlings; it came in handy when disc brakes were installed later. Disc-braked C and D Jaguars draw 30 psi pressure from a Plessey pump at the gearbox and meter it through a Girling-designed master cylinder, while Mercedes used a similar gearbox-driven system on the W196 and 300SLR. Recent BRM's used an engine-powered hydraulic boost for their discs until early '58, when the servo was dropped on the grounds of complexity and a super-light pedal feel which made it all too easy to lock the wheels.

In general it makes excellent sense to combine a stable, low-servo brake with some well-controlled form of power boost, since the assistance is just there waiting to be used. An external servo can be a boon to driver comfort and allows a free choice of brake linings, including the durable but low-friction metallic linings. Ferrari used a practical stopgap in the form of the Baldwin brake booster, an attachment which, in effect, brings the shoes in contact with the drum with a large piston under low pressure, and then applies higher pressure with a smaller piston. Called the "Hydro-booster", it's fitted on the pressure side of the master cylinder and is now standard on the Aston Martin DB Mark III. It does *not* in any way avoid an increase in pedal travel as the linings

wear.

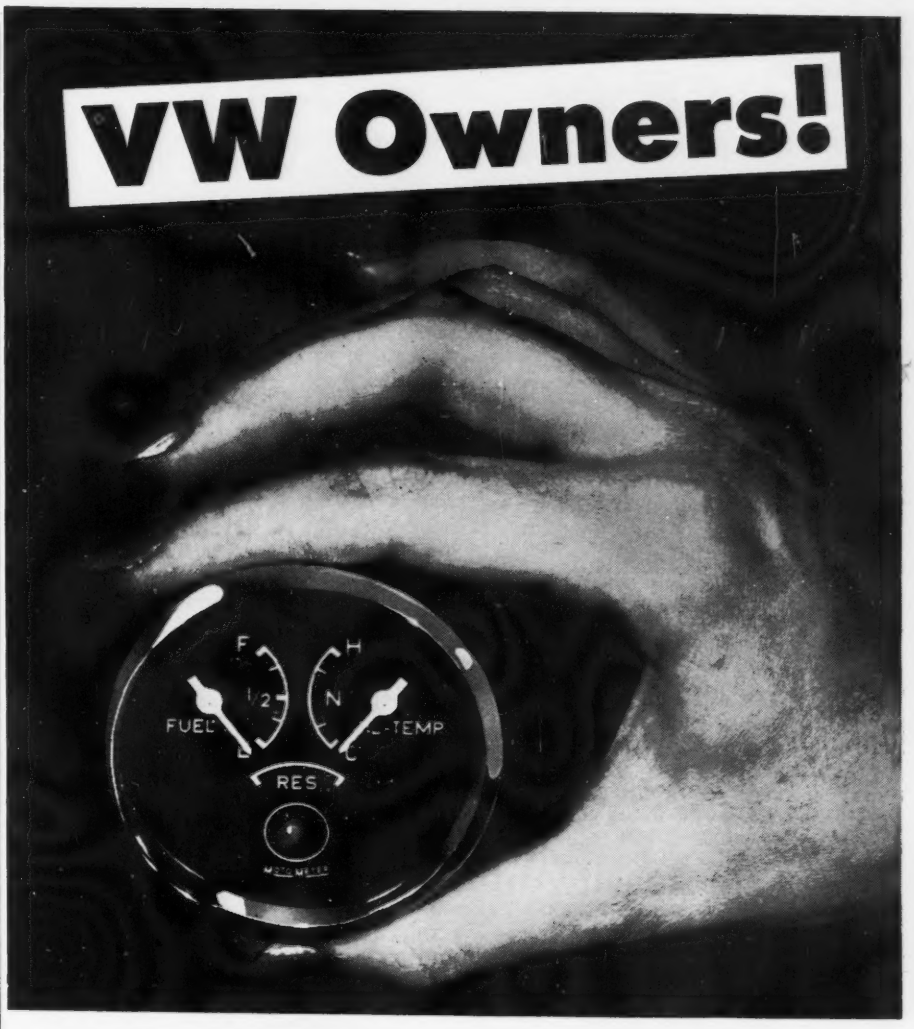
Before the War, Auto-Union used to conduct their own tests of friction ratings and durability of the brake linings supplied them, but nowadays most race car builders haven't time to be so thorough. They rely completely on the service and know-how of lining manufacturers, who fortunately can produce reasonably consistent results in a realm which they themselves admit is far from being an exact science: In Italy Fren-Do is popular while Jurid is the word in Germany, but Ferodo and Mintex in England have recently led in research and in support of racing.

Before the Thirties the best lining was a bonded asbestos laced with heat-conducting brass wire which tended to score drums. Its friction was low and its resistance to heat likewise. In 1930 we were presented with an impregnated asbestos-base lining free of metallic inclusions, boasting higher friction and lower wear. Ferodo's trade name for it was "MR", and it soon found use on Alfa's Type B *monopostis* and their contemporaries. During and since WWII, research has more clearly defined and controlled the qualities of several types of lining, so that all kinds of braking needs can be catered to. Softest but least fade-resistant are linings based on asbestos textiles (Ferodo MR41), some with zinc wire inclusions (MZ41). Molding techniques have produced harder linings less affected by heat, based on chopped asbestos fibers in a rubber/resin binder (Ferodo VG95). And there's a very hard resin molded lining for extreme temperatures, also termed "dry mix" (Ferodo DM). As a racing car designer, your job is to choose the softest possible lining which can still stand up to the temperatures that will prevail within your brakes. That way you get smooth, complete contact with the drum or disc surface, avoiding as much as you can the uneven temperature gradients that can lead to brake chattering, hot-spotting and drum failure. If your drums are badly designed or placed, you've no recourse but to use "hard" linings and wait for those burned, discolored spots to appear.

With wide drums well out in the air stream, the 158-9 Alfas were able to use a soft, textile-based lining with great success. Only slightly less effectively cooled, the 4CLT Maserati's conventional brakes used a textile lining on the trailing shoes and a harder rubber/resin molded lining for the more highly loaded leading shoes. Leading-shoe-braked G.P. cars like the HWM and the first BRM also required rubber/resin molded goods, a grade equivalent to that used by most Grand Prix cars today (drum-braked, that is). Only the Lago-Talbot, with its drums tucked away inside the wheel rims, needed a very hard dry-mix lining and had to endure drum maladies.

Bonding of linings to shoes promotes heat transfer and makes use of every bit of lining area, but isn't quite trusted in some quarters. Ferrari, namely, bonds on his front linings but sinks in six rivets per shoe just to be safe. His rear linings, like those on all Maseratis, are riveted only. Porsche trust bonding alone for their

(Continued on page 76)



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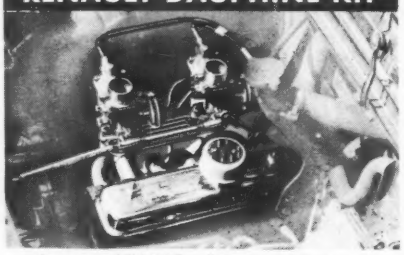

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Racing Brakes

(Continued from page 75)

racing brakes, as did Mercedes-Benz. The Untertürkheim boys, however, added a typical extra twist. They use center-pivot brakes, you'll recall, in which each shoe has a part-leading, part-trailing action. To about the *leading third* of each shoe, then, they bonded a separate segment of a harder lining to retard wear and fade at just that point! The remaining two-thirds may in fact have been a soft textile-based lining, with only the tips being molded. The two segments are beveled and bonded together, with even the angle of overlap making separation very unlikely. In combination with the basic center-pivot design and the automatic adjusters, this guaranteed that every square centimeter of the W196's lining area would be ready to go to work when the cutoff point loomed ahead.

Mintex engineers figure that a square inch of disc brake lining will have to soak up and dissipate about seven times the heat that would afflict the same area in a drum brake lining. It's lucky that most brake discs aren't fazed by extremely hard molded linings, because that's what they have to have. To keep them effective at 350° to 450°C., most have a high content of brass chips, a practice that can't be carried too far because the pads will insist on welding themselves solid to the discs.

—*kl*

Aston-Martin Ulster

(Continued from page 33)

the speedometer replacing a clock on the left hand side, and an additional switch group has been added to the already impressive row of toggles.

In action, the steering proved to have the one-inch play at the wheel rim that was called for in the instruction manual. There was only a nominal amount of road reaction, while response was quick enough to allow sharp right angles to be negotiated with three quarters of a turn of the wheel.

Little concentration was required to hold a line while moving fast on smooth bends, but the familiar macadam ripples could make life very difficult. Most of them were reproduced throughout the frame, and the front wheels would readily begin to bounce with vigor. Bodywork designed for use under those conditions must of necessity be skimpy, and in spite of its handsomely cast side plates the whole cowl section shook enthusiastically.

I learned of this wheel bounce both physically and visually; the right hand wheel with its unsprung cycle fender being in easy sight at all times, not to mention the ground underneath it. Cornering is fast and dead flat, with ample steering speed to correct for deviations. The car's owner credits it with a high level of resistance to breakaway, and he has not hesitated to drive it fast over long distances. On a trip, for example, from West Croton to Watkins Glen, the Ulster cruised happily at 3500 to 4000 rpm, which represented between 65 and 70 miles per hour. At these speeds it got 24 miles per gallon and used absolutely no oil, which is pretty good for a 32-year-old.

Italian Holiday

(Continued from page 47)

beckoning us inside just as a customer's 4.5, with customer sitting transfixed alongside a works tester, came screaming up the road, banged down through the gears, piled on the brakes until they smoked, and wheeled sedately through the gate into the inner enclosure. The factory, in modern and utilitarian red brick, is built around a spacious quadrangle, one side housing offices and the racing shop, one side the GT assembly line, the third machine shop and stores, while the fourth????

After a short wait we were provided with a pleasant young man in black smock who apparently spoke English. After he had been taken aside and cautioned (in Italian) for Pietro's sake not to show us anything important, by a darkly sinister type in three-button lizard-stripe, we set off into the racing department. First off we sidled into the engine assembly room, eyed saturninely by all the assembled mechanics, to the sibilant noise of Important Bits being whisked into drawers. Skirting our way around a brand new 4.9 engine on a trolley, we were shown the beautifully machined and highly polished gubbins going into one of the Dino GP engines, while at the other end of this particular bench a two liter V6 sports engine was under construction. Scattered casually around were such objects as a fuel-injection V6, a pile of Dino cylinder heads with enormous ports, and a large heap of assorted engines of various displacements and cylinder permutations, including two examples of the DOHC V 12 which one English editor claims does not even exist. My, I thought, one or more of those old tired GP Dinos would go well in my Alfa, as I looked around for an easily jimmied window, but encountering instead the hostile stares of the mechanics who were fondling bearing scrapers and such, reluctantly abandoned the idea; at least until another time.

Straightaway we passed into the adjoining section, which surprised me somewhat when we found a chassis jig for the GP and sports frames. From the sometimes inconsistent handling of Enzo's little efforts I had imagined that someone had provided a couple of the more muscular types of four wheels, gearbox, rear end, steering wheel, and a few lengths of iron maccheroni plus welding torch and told them to get to work. If the result handles, fine; if not, there was always another spaghetti bender. There we found an almost complete GP car, a ditto two liter sports of the new type with freni a dischi, and another of the latter sans engine, an omission which was rectified when we pressed through very solid double doors into the engine test room. This chamber of horrors contained four engine testbeds, of which two were occupied; one with a silent Dino GP and the other, slightly unsharp at 7500 rpm, with a two liter (Dino) V6 sports mill. This room, at least, fulfilled one's expectations of what Life at Ferrari would be like, being draped with an incredible assortment of plumbing, tubing, boiling water tanks, old Fiat fanbelts, dial gauges big and small, and chain hoists. The exhaust headers clipped to enormous lengths of cackletube with rather bent megaphones on the ends, exhausted casually out of two large doorlike apertures in the back of the shop, to the utter unconcern of a character with wheelbarrow outside who was leisurely shifting bricks. Other interior decor included nicks in the ceiling and a forlorn type in soiled blue Pirelli suit, pink wads of La Gazetta Della Sport wedged in his ears, who was busily running the engine up to 8 thou and back trying to get a proper reading. It wasn't clean as yet; needless to say everything buzzed in harmony, including my eyeglass lenses, eardrums, the spools in the Rolleiflex, and fillings in our teeth. Carefully stationing myself out of the plane of rotary motion, I shot off a few pix, in spite of the difficulties of everything going in and out of focus as the revs went up and down. The peak power seemed to be at 7500 or so, but of course who knows what cam/jets/venturis/whatnot was fitted?

Outside, the silence was absolutely deafening, and it was not until we noticed an apparently mute police dog barking that we realized our state. However, after a few huge yawns and mints all around our least important sense (at least at Ferrari) gradually returned, just in time to be assaulted again as we were led into the long hall which housed the GT production line. A long flat-topped ramp, with six Farina-bodied coupes aboard, stretched along one

(Continued on page 78)

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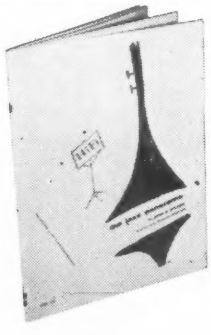

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Italian Holiday

(Continued from page 77)

side, with mechanics sticking out of them at various odd angles. The other side provided space for the frame and suspension assembly, which, when stuck together, are trucked to Farina in Torino for clothing in their steel coupe suit. Other chassis, of course, are sent to Scaglietti in Modena for the competition coupe bodies (aluminum) and the California roadsters. When the unfinished cars are returned from the bodymakers, gearboxes, engines, and other bits and bobs are clamped on. After that the vehicles are sometimes again returned to the carrosseries for final touch-up, special trim, or one-off paint jobs. The engine assembly shop is at one side of the ramp, backed by the vast parts bins that allegedly make Ferrari, aided by a high degree of interchangeability of components, able to produce an engine of any capacity and number of cylinders overnight. The standard 250 GT engine department was hardly under forced draft, about three or four being visible in various stages of deshabillé. They were being put together very carefully but the difference between production parts and racing ones was certainly striking; many of the former being rather crude forgings and/or not being particularly well finished off . . . at least for the price bracket in which the car runs.

As we passed down towards the machine shop, we caught sight of a small four-cylinder block casting, unfinished as yet, which did not look like a component of anything that I had ever seen chez Enzo. I asked about it, but the little man was suddenly struck dumb, seemingly anxious to hurry us on down the line. Later trial balloons at the Reale evinced suggestions anywhere from a 1500 cc sports engine for Fiat/Ferrari/ditto new F 1, a 1000 cc mill under development for Lancia, and half of a 1500 cc V8 for some Prominent English Firm. Time, I suppose, alone will tell. And time was getting short as we ambled down past the batteries of machine tools that turned out the parts (in multiples of 12!) that went into the Ferraris great and small.

Time was up, the whistle blew for lunch, and workers streamed all around us on their way to the factory canteen. Realizing that our guide was suffering the pangs of and feeling it a bit ourself we whizzed through the rest of the shop, pausing only to shoot a few pix of the Dino sports block, and turned him loose (or was it the other way around?) in the central yard once more. Shaking hands all around without dropping the secret goodies we had concealed under our coats (next month we go back for the mainspring) we leaped into the Alfa . . . which felt pretty small beer by this time . . . and rushed off down the road towards Modena and lunch.

Two hours, three plates of spaghetti con vongole, and four bottles of Lambrusco later, Pete Coltrin came and winkled us loose from the table to go see the new Ferrari F 1 tested at Monza Autodrome. This turned out to be a false alarm so we went over to see Alessandro de Tomaso's Osca special, which he plans to enter at Le Mans. This bolide, rather loving-hands-at-home, boasts a 750 Osca engine crossways behind the driver, pushing through a converted VW gearbox-rear end, and independent rear suspension with an interesting system of crossover wishbones. It might work at that, but the 750 Osca is such a lovely little car! However, right next door was an interesting roomful, including Tony Settember's prototype sportster, which has American ideas, an Irish designer, Italian handwork, and Corvette engine (or Maserati on demand), impressing one considerably more than the above effort; several assorted Centro-Sud vehicles including a very squashed Maserati; and an interesting closed-off alcove in the back where sundry stealthy Italian types, not entirely unknown to us, were dissecting, weighing and otherwise measuring, down to the last nut and bolt, Behra's RSK Porsche which had recently arrived from Stuttgart. I gave them the fright of their life when we walked in as occasionally I have already been mistaken for Baron von Hanstein, the Porsche racing manager. All I had to do was bare my front teeth and rasp, "Ah zo . . . was gibt hier?" and they straightaway shot into the back and slammed the door with the speed of light. I felt myself the recipient of searching glances through a crack in the wall, to the accompaniment of a crashing silence, and eventually one of the older conspirators was sent out to recon the situation. Evidently he gave the all-clear, as the thumping and bumping indispensable from the erecting of a large spring scale began anew. I often wonder just what they were up to.

We got up rather late the next morning, after going down to Bologna in Pete's Porsche to eat at the famous Pappagallo, which we found pleasant enough, but not worth all the fla-fla that has been written about it (which goes, for that matter, for the Porsche too). After checking the Autodrome for activity, we whizzed over to Maseratis to have a snoop around. They really couldn't have been more pleasant, detailing the charming Ing. Pollio as expert guide. In direct contrast to the rather cloak-and-dagger atmosphere at Ferraris', we found the utmost cooperation chez Orsi as we were introduced around, had the new small-tube 2000cc sports detailed out to us, and were given the latest gen on the 4.2 V8 "Gelati" Maserati which appeared at the Monza 500 and which they were thinking of entering at Indianapolis. Needless to say, we were also shown the improved 3500 GT which was sprouting disc brakes for the Geneva Show, and were even given an invitation to a new sports car tryout at the Autodrome in a week or so. One can see why they have such a loyal cadre of private owners.

That afternoon, the elusive Ferrari F-1 finally did appear, accompanied by works tester Severi and a fine collection of engineers. After he had whizzed about for a while, mostly testing shock absorber settings and the disc brakes but having been rather hampered by a defective tachometer, Behra arrived and also Enzo himself. The former screeched around at a great rate, under the sombre gaze of Severi, apparently getting sideways on the corners just to find out what would happen if he got sideways. We stood the

racket for a while after we had gotten all the pictures that we needed, then bugged quickly off to Scaglietti, the carrozzeria that does Ferrari's competition body-bashing. Again, here, the gent in charge (Scaglietti himself?) was exceedingly helpful, giving us the A 1 Baedeker of five or six of the graceful coupes . . . the latest one-gill model . . . three California roadsters, and a Super-America which was getting some super dents ironed out of it. Light, airy, and modern, this shop also destroyed misconceptions of the Italian body shop as a dark oubliette converted from a blacksmithery, many of the tools being retained and old Chianti bottles used as body formers. At that, Scaglietti's had kept the traditional tree stump, even though he was a bit put out when Eddie took a picture of it!

Again we got a late start the next day; Lambrusco is a pleasant wine, faintly fizzy and not at all strong, but it does seem to promote sleep. We luxuriated in and frosted tile bathroom of the Reale so long that we really couldn't go back to Milan without another whack at the lasagne mit green noodles, could we? Which of course meant that we discovered that the Spyder would do just on 100 mph (speedo) if pushed, continuing for mile after mile with no ill effects. None except those caused by the horn that is, which apparently lived under my seat and almost drove me coo coo.

Eddie decanted me at the Stazione Centrale with time to spare; after a discussion with a multilingual policeman who didn't want us to park in the taxi rank, we bade our goodbyes, and I strolled onto the train with a copy of the Sunday Times, three days old. Small bottle of Valpolicella, salami sandwich, and orange from the vendor with his little cart, coffee from the coffee bloke who wanders about with the percolator, and home to bed. Four hours on the blooming train. Ho hum.

hnm III

Chevrolet Bel Air

(Continued from page 45)

at around 40 to 50 mph. To overcome or get by it, it seems necessary to get onto the secondary butterflies. Fortunately, additional throttle springs come into play so it is easy to feel your way along. It seemed that the linkage could be modified to advantage to provide greater travel between closed and full throttle to make things a little less sensitive. If this were done, the drawback would be that your right foot would have to swing through a greater angle and either one position or the other might turn out to be rather uncomfortable. After all, this human ankle only works comfortable through a limited number of degrees. Chevrolet has the problem of distributing three hundred horsepower evenly through them.

The clutch pedal was a very stiff one, quite in contrast to the power brakes and the rather light touch involved there. So stiff a clutch that one would shift to neutral for even short waits at a traffic light.

(Continued on page 80)

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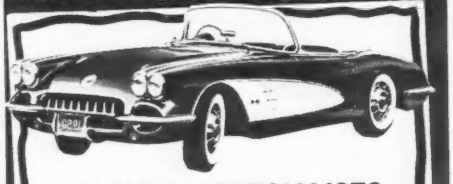

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Chevrolet Bel Air

(Continued from page 79)

Just as well, why wear out the throw-out bearing?

We gave the brakes a really punishing test, making many, many stops from over sixty and accelerating immediately up again without a trace of fade. When we tired of this (we, not the brakes), we stopped to have a look at them. Smoke was curling out from the fenders. A careful looks showed us that it was only the black paint on the outside of the drums. Tough.

For kicks, we then tried running from zero to one hundred to zero as quickly as possible. Two runs with this two-ton (nearly) machine gave these results: 0-100 in 21.9, 100-0 in 7.2 more seconds in one direction for a total of 29.1. In the other 20.7 plus 6.7 totaled 27.4 seconds. The better, second run works out to a declaration of ½ "g" but this includes the time spent getting off the one pedal and onto the other. Remember anyway, as long as brake fade is not a problem, which it wasn't, braking deceleration is limited only by the coefficient of friction available between the tires and the road.

After these runs were over, we drove along quite happily using the brakes in a normal manner. Suddenly we were disconcerted to find that the brakes were pulling very strongly to the right. When we returned the car it was suggested that we might have cracked a drum, but since this strange pulling had by then disappeared, we could only conclude that perhaps these brakes still aren't quite ready for the average customer—not that he'd ever use them as hard as we had. As a matter of fact, doing our SCI brake test of consecutive 0-60-0 runs, we became impressed with the fact that other than for testing purposes, no one would drive this car in such a manner, not even if he were racing it at Monaco or Vineland. It seems safe to conclude that Moraine and Chevrolet have brake fade as such licked, it only remains to make the metallic linings more livable for the average driver. From a cost angle, future economies are assured as volume goes up because production is already highly automatic. Besides, drum sizes could probably be reduced, saving weight (unsprung) as well as money.

Steering on the Bel Air leaves one thing to be desired: Quickness. Nearly six turns lock to lock with a wheel to wheel (steering to road) ratio of 28 to one is too much. Power steering reduces this to 5.2 and 24:1 which is still TOO MUCH. However, with nearly a ton on the front wheels, I suppose it's inevitable.

The car responds really splendidly to the wheel, though tearing through an ess-bend at sixty-plus required arms like pretzels. The big sedan heeled over like a Snipe in a squall but we got through as fast as anybody could want to. At more mannerly cornering speeds, the Bel Air exhibited surprisingly mild understeer with sensible but mild feel at the rim.

At very high speeds, namely at over 100 mph, the car felt a bit too light but as long as you didn't man-handle it, everything was alright. Flat out, the fat tires

perhaps were the cause of a trace of yaw oscillation. The car would go straight down the road, but in so doing its nose would seem to point slightly left and right. This may be a misrepresentation, as phenomenon such as these need proper instruments to pin down accurately. Perhaps it was reacting to gentle gusts of wind from the side. Whatever it was, the steering was staying very light and the best course seemed to be to let the car have its head, just guilding lightly round whatever bends there were in the road.

Ride comfort was extremely good even with the 35 pounds of air we maintained for the entire test. We did make a preliminary run at 24 in order to compare with a stock-sprung Impala at the same pressure. Perhaps our bottoms aren't very sensitive, but on a fairly smooth concrete road, the difference was barely (?) detectable. When we ran the tires up to 35, the big 8.00's still soaked up the bumps with ease. Can't help but wonder how much you'd lose with the 6.70 x 15's in comfort and how much more stable it'd be at high speeds.

We were, all in all, very much impressed with this car. It would be a great thing for motoring in general if the $44 chassis option could soon become standard equipment. But until the public as a whole is more interested in handling than in riding rough-shod over pebbles in the street, the competitive sales advantage will lay with the salesman whose demo gives the softest ride.

When we congratulated him for making a silk purse out of more or less generally available GM parts, Mr. Duntov suggested that the credit should go to Mr. Ed Cole, General Manager of Chevrolet Division. He is an exceptionally fine driver with a real appreciation of handling and steering subtleties. He enjoys driving the cars built in his factories and is interested in them as a driver, not merely as a division manager. Mr. Duntov feels that this unusual-for-America circumstance is a very good influence for Chevrolets in general and for Corvettes and such sedans as the one tested in particular.

Detroit's favorite defense for the many criticisms lately sent its way is that the public gets what the public wants. One reason that we're in business is that the public should be better informed about *what* it is about to buy. Secondly, Detroit is still open to the charge of building to the Lowest Common Denominator of the public taste. By their catering to individual emotional requirements such as prestige, the country enjoys a socially undesirable total, namely urban immobility and economic extravagance.

One of the more popular complaints about Detroit cars is that they have gotten progressively larger on the outside and smaller on the inside. In the big hurrah about the brilliant new concept of compact cars, most of the cheering is for the idea of making a car that's smaller on the outside. Relatively few people seem to be bothered by the fact that you can't get six adults easily and comfortably into contemporary American sedans.

The car's outside dimensions are huge, especially for what has shrunk to basically a four-passenger car on the inside. You can get three abreast in a pinch, but whenever we carried three, there was never any hesitancy, the third man climbed in back. Incidentally, legroom is better there than in the front because of the deep wells in the floor.

It's so big that we were carried away by the apparently tight turning circle. But it turned out to be a huge 43½ feet, wall to wall.

We noted that much fat could be trimmed from the current body shell without tightening the interior at all. There's about four inches excess between fan and radiator, and for that matter, the radiator could be moved back an inch or two. The trunk could be usefully shortened, vacationers could tow small utility trailers for two weeks out of the year instead of trying to park the Queen Mary for the other fifty. But the place for really trimming off waste fat would be along the sides of the car.

The *raison d'etre* of at least the fat on the sides is economic. All five GM lines use essentially the same body panels, that is, the interior stampings, the ones out of sight that *have* to fit correctly. It's as if a baker made five identical cakes but covered each one with a different frosting, full of swirls and blobs to make them look like five different cakes. Detroit calls it product identification. We call it camouflage.

Could be that GM might build a compact car without even trying.

(Continued on page 85)

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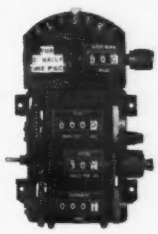

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A Comet Called Archie

(Continued from page 25)

Game leg handicapped Archie a bit on Le Mans starts, but in this instance he kept right up with team mate.

The field shifts positions. Already the old lap record has been shattered by almost everyone. This is the fastest race ever seen at Silverstone. The average speed is up over 100 mph.

The pace is killing. Hawthorne's timing gear lets go and he is out. Now Moss leads. Fangio grimly follows him through turn after turn . . . and Archie plays a waiting game because this is the speed that cripples cars. Sixty flashing miles later Fangio is out with clutch trouble and he screeches into the pits to take over team-mate Collin's car. This mount lasts him only twelve miles.

Salvadori has slipped into second spot behind Moss. Now Archie moves, sticking the snout of the Connaught almost up on Salvadori's tailpipes . . . pushing, probing, forcing aggressively.

Moss's superior car keeps him out front. But Archie, boring in behind Salvadori's Master, keeps the pressure on. And it soon tells! Salvadori roars into a turn, fights the wheel, loses it, wins control momentarily and then loses it completely. The Maserati crashes.

Archie slips by, shaking his head sympathetically as he flashes a look at the wreckage. But now there's no time for sympathy. Moss is far out front. Archie asks everything of the Connaught and she responds. But the lead is too great and 180 miles are over before he can close the gap. Moss wins at 100.47 mph. Archie is a close second.

It has been a great race, a typical race. At Goodwood Archie catches Hawthorne and leads. With Moss they make it a three-way race until Archie's car blows up in the final laps. That day he sees two friends die in action. Later, at Aintree, he turns in the fastest lap of the day but an oil line snaps and he's sidelined. Bad luck begins to dog him.

It's the same story a few weeks later and again at Aintree. For eight laps Archie leads but again oil blows back, forcing him out. Archie shrugs philosophically, "Ah, well . . . that's racing."

Racing — no longer a sport but a way of life, a chance to show the world that "even if God has denied you one hand and made one leg shorter than the other you can accept the challenge and leave your mark in the records of the world's fastest men.

He won at Brands Hatch, setting a course record, and the same day jumped into an Elva with a special fiberglas body to capture first place in a race ironically classified as a "handicap."

He won his class in the Daily Express Production Car Race at Silverstone, pushing a little D.K.W. at a terrifying average 70.76 mph. He won the two liter class on a Lister a few weeks later.

Meanwhile, he looked toward the Continent and bigger events. But European officials balked. No, his handicaps were too great. Let a man with only one complete arm race? *Mon Dieu!*

While English friends made appeals in high places, Archie went on racing. The dark helmet, dark polo shirt and flaring mustache above gleaming teeth became a familiar sight on English courses. The spectators loved him.

"Blimey, what guts!" they said. And they were right. Guts at Silverton, where his Lister-Maserati turned the fastest lap. Guts at Brands Hatch, Oulton Park . . . wherever the fastest company met to roar down the thin tightrope between triumph and tragedy that is motor racing.

It was hot in the pits that March day in 1958 at Sebring, Florida. I leaned sweating over the wall, watching my Corvette scorch off the line and dash away in front of the field. I could hear the thin snarl of the Ecurie Eccosse Lister Jags as the pack untangled from a Le Mans start on the twelve hour grind.

Archie was behind the wheel of one of the Jags. If I had a favorite running in that class, it was Archie. I was not alone. Archie clicked with Americans.

"A spot of brew, Archie?" we'd ask in pre-race days at the end of tune-up sessions.

"Good show," he'd say and then accept an icy can and sit back to bench race the way drivers the world over do. Except I've never met any more modest guy, never heard him blame weather, his car, or other drivers for failures, never heard him claim personal victory when he won.

Now, between following the progress of the Corvette on which I was crewing, I watched Archie.

It happened fast. Archie dove deep into a corner close to my pit and suddenly slowed. The engine had blown and the car stopped almost as if it had run into wet cement.

Olivier Gendebien, on a Ferrari, was close behind. He didn't have a chance. He braked desperately. But the Ferrari hurtled up the Jag's back and ground to a horrifying halt, one front tire sitting squarely against Archie's helmet!

Archie twisted in his seat, raised an arm and flashed a big grin at Gendebien. The Belgian driver blinked, amazed. Archie waved him away. Gendebien threw the Ferrari into reverse, backed off the Jag and tore away. Archie climbed out, unhurt.

"Oh," Archie calmly told me later, "odd sight, that . . . have a bloody Ferrari sitting on your head. I'll bet you laughed."

"Oh, sure," I said. "it liked to kill me."

Archie stroked his mustache and squinted at the Florida sky. "On second thought," he said, "me, too!"

Months later on a Spring night in a quiet bar 4,000 miles from England two sports car men were chatting.

"Read in the paper tonight that Archie got it at Spa, in the Belgian GP," one said.

"How?"

"Flipped and burned. He was going like hell, really putting his foot in it. He really wanted to make good on the Continent, you know."

"Yes. He was a terrific driver."

"And a helluva nice guy."

He was 31 years old when his comet burned out.

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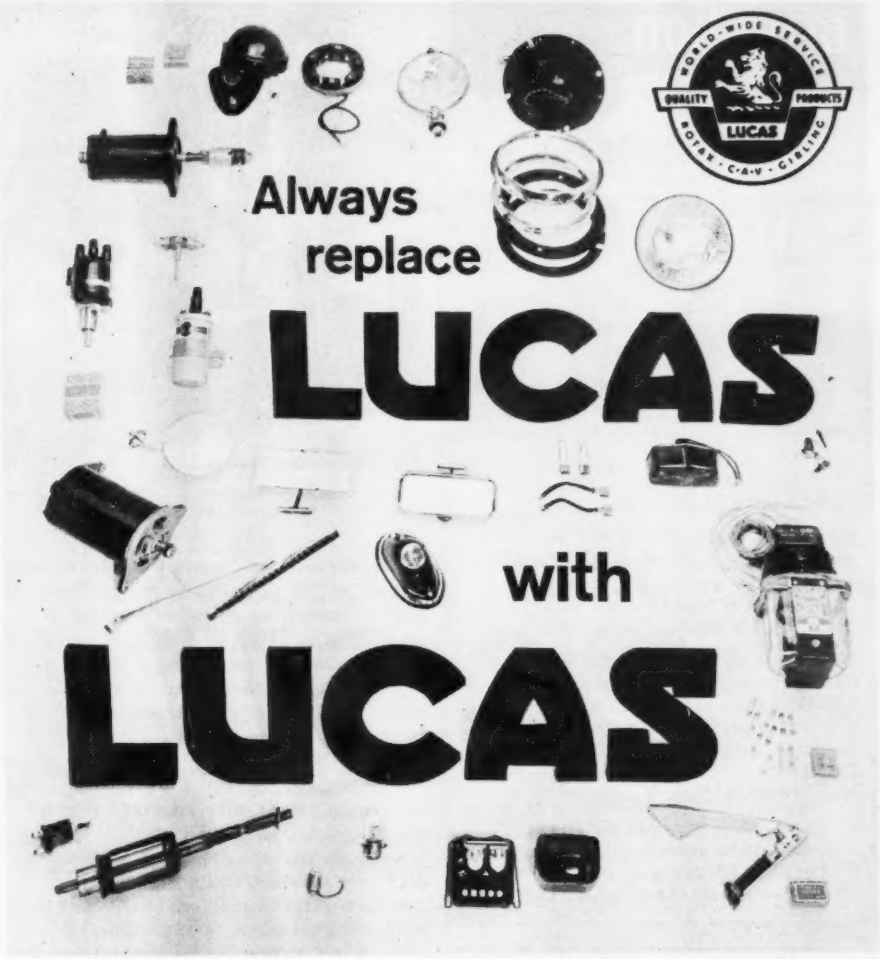

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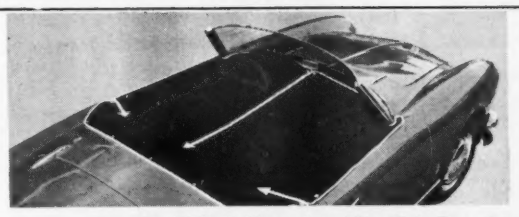

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What Did You Buy?

(Continued from page 41)

can cause serious highway grief and are likely to be skipped over by hurried people processing many cars under pressure.

Have the car raised on a lift or jack that leaves the wheels free to spin. Then, while under the car in position to see them carefully, spin the wheels and sight on the edge of the wheel rim, not the tire. The wheels should run true, sighting on a tire might throw your eyes off while they try to follow the tread design. While the wheels are spinning, check the inside of each tire for otherwise unnoticeable damage from shipment. Check every wheel for trueness, then place the spare wheel on the front wheel that you hadn't tightened, to check it. You might find one bad wheel out of a hundred, but make sure that it's not on your car. Wire wheels are noted for being egg-shaped even when new. This is due to the sub-contracting of such equipment by the original manufacturer, but he is responsible, nonetheless. An egg-shaped wheel can cause many trips to a front-end alignment shop since it will act like a loose assembly at higher speeds. Incidentally, don't have your wheels balanced when the car is brand new, it's a waste of money until the tires have "set" their carcasses to the wheel and the soft spots have seasoned out. This takes about a thousand miles.

If your master cylinder fluid level was low, this is the time to look for hydraulic system leaks. Have the mechanic or a friend press hard on the brake pedal, and hold sustained pressure for at least ten to fifteen seconds. Check out each coupling; have the wheels pulled if the pedal sinks under the pressure and check each wheel cylinder. Be very careful here and do a thorough job. It might be that your car was the one being filled when the man at the factory ran out of fluid, but make sure nothing is wrong.

If you had underseal applied as part of your purchase, make sure that there is none on the muffler, the driveshaft, and the moving joints of the suspension. You can find the latter by noting the grease gun attachments. Have it removed from the driveshaft or muffler with solvent, like gasoline. A few ounces of weight, off-center on the drive shaft, will cause off-center wear and eventual leaking of the rear end grease seals. Muffler heat will be sufficient to start a small fire if it is covered with the sound deadening compound. If the front suspension has to be washed with gas, get it greased again while the car is on the lift. Any plugged fittings can be immediately spotted and replaced. Have your car lowered and then wheel it over to the headlight chart. While they are being checked, replace the spare with the former front wheel. Now you know that all wheels are true, and can rely on them in perfect confidence. You have, as well, learned how to change a flat on your new car!

The last few steps are always the most painstakingly slow, don't rush them. Check each light and switch, including the wipers, signal indicators, oil and generator lights, and those other lights which you've located in the manual you borrowed. You might want to rush down to the drugstore tonight for some essential article, like sunburn lotion, and this is the time to get acquainted with your electrical system.

Probably the last items on your check list will be little things, like the screws holding the windscreen on the MG, or having the ends of the top latch swivelling screws on the Alfa Romeo convertible specially tapped so that they spread, and can't be lost. You'll want to check the small cotter keys in the accelerator linkage of BMC products, or the light switch of the Volvo, a very sensitive affair.

The entire procedure won't take over two hours, even if you dawdle somewhat. Not only will the time be profitably spent, but you will have learned a lot about your dealer and the services he offers. Or, you might feel like the man who knew his dealer for a long time, went to the club luncheons with him, and knew that anything wrong would be righted. It would too, except that good friends have a way of imposing on a business friend who ends up taking a very slender profit out of any transactions. Since most dealers have to operate on a very small margin in order to meet the competition, any repairs that could have been prevented by your own check-up could come right out of his pocket, directly. That's no way to treat a friend.

Chevrolet Bel Air

(Continued from page 81)

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TOP SPEED:

Single one-way run — up wind.....122 mph

ACCELERATION:

From zero to	seconds
30 mph	4.0
40 mph	5.3
50 mph	6.8
60 mph	8.4
70 mph	10.5
80 mph	12.8
90 mph	15.6
100 mph	18.8
Standing ¼ mile	16.7
Speed at end of quarter	94 mph

SPEED RANGES IN GEARS:

I	9- 61
II	12- 81
III	15-102
IV	20-top

SPEEDOMETER CORRECTION:

Indicated Speed	Timed Speed
30	32
40	44
50	56
60	68
70	80
80	91
90	105
107	122

FUEL CONSUMPTION: 11.8 mpg

SPECIFICATIONS

POWER UNIT:

W-348	Water-cooled V-8
Valve Operation	Pushrod ohv
Bore & Stroke	4.125 x 3.25 in (104.7 x 82.5 mm)
Stroke/Bore Ratio	0.79/1
Displacement	348 cu in (5701 cc)
Compressed Ratio	10.5/1 (usually 11¼)
Carburetion by	One Rochester quad
Max. Power	310 bhp @ 5600 rpm (usually 320)
Max. Torque	347 lbs-ft @ 3600 rpm (usually 358)

DRIVE TRAIN:

Transmission ratios

	test car	optional ratio
I	2.20	(2.47)
II	1.66	(1.53)
III	1.31	(1.00)
IV	1.00	—

Final drive ratio..3.55 (3.08, 3.36, 3.70)
Axle torque taken by upper and lower control arms

CHASSIS:

X-Frame with box section rails and front and center cross member. Open rear cross members.

Wheelbase	119 in
Tread, front and rear	60.3, 59.3 in
Front Suspension	Independent, unequal wishbones, coil springs, anti-roll bar. Spring rate @ wheel 129 lbs/in (96 stock)
Rear Suspension	Rigid axle, upper and lower control arms, coil springs. Spring rate @ wheel 175 lbs/in (101 stock)
Shock absorbers	Delco tubular
Steering type	Saginaw semi-reversible recirculating ball
Steering wheel turns L to L	5.8
Turning diameter, curb to curb	40.8 ft
Brakes	Moraine sintered metallic
Brake lining area (net)	130 sq in
Tire size	8.00 x 14

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Weight distribution, F/R as tested	52/48
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Speed @ 1000 rpm in top gear	22.0 mph

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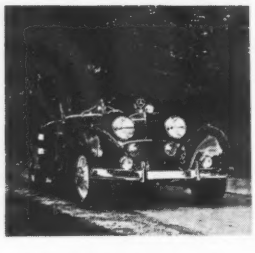

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Le Mans Melange

(Continued from page 67)

Most dramatic of all the long hauls was the late Pierre Levegh's heartbreak soiree in 1952, the fateful day his 4½-Talbot broke its crankshaft when holding an unassailable lead only fifty minutes from the finish. It was this calamity, whereat hundreds of French patriots wept openly, that gave Mercedes their first win in a top ranking automobile race since 1939 (Lang and Reiss first, Helfrich and Neidermayer second, both on the then new 300 SLs). Incidentally, Levegh's self imposed ordeal also prompted the no-solos rule now in force.

But growls mingled with sobs in the wailing wall lineup of 1952: growls against the unhappy Levegh himself, who, murmured his compatriots, had acted like a selfish imbecile in monopolising the wheel of No. 8. Over fifty years of age, he was, claimed angry public opinion, physically incapable of doing justice to his car in the exhausting closing stages of the race. Levegh did not defend himself and his true reason for playing loner was not disclosed until after his death—ironically, at a Mercedes wheel—in the Le Mans holocaust of 1955.

For many hours before the Talbot's final and irrevocable blowup at 3:10 on Sunday June 15, 1952, Levegh had known one of his engine's main bearings was in bad shape, likely presaging eventual crankshaft failure. It *might* hold out for the duration of the race, then again it might not. But as long as the Stuttgart competition had no inkling of the trouble they probably wouldn't risk drawing on their last reserves of speed. There was only one way to be sure the Mercedes pit stayed in the dark about the Talbot's plight and that was to confide it to nobody, but *no*body. If he stopped and handed over to his nominated co-driver, René Marchand, Levegh would have to fill Marchand in on the whole deal, in earshot of his own mechanics and any me-too's who happened to be close by. So he stuck it out and held his tongue. Finally, at ten minutes past three, the crank fractured.

Fortunately for the posthumous fame of this fine Frenchman, his story didn't die with him, it just seeped into circulation as his own circulation ceased.

This isn't the place for morbid appraisals of Le Mans mortality statistics, but an irresistible item concerns the casualty who, according to one theory, caught his death from a revolver bullet, fired by an unknown assassin on the Mulsanne sidelines. It maybe wasn't a very good theory but neither were any of the others used to explain the demise of Marius Mestivier (Amilcar) in the year 1925. Unapropos, but redolent of the raw humour that gets the biggest laughs in France, was the incident of a Delahaye chassis that broke at Le Mans in 1951. Co-drivers concerned were Pierre Meyrat and the late Guy Mairesse. Mairesse, who was driving when the frame fractured at 8 o'clock on the Sunday morning, didn't tell Meyrat about it until the race was over, because, as he explained with a light laugh, it might have made the boy nervous. Napeoleon, on the other hand, figured that "uneasiness stimulates zeal."

The way most British race historians tell it, you're left with the impression that the so-called Golden Age of Le Mans was an almost exclusively British creation, with continental marques and men providing little more than light relief to the Homeric exploits of the Great Green Cars (ugh!) and their demigod drivers. This wasn't precisely so, as the most cursory statistical analysis shows. Between the wars, Alfa Romeo scored four wins to Bentley's five. Alfa and Bentley placed one-two-three once apiece, Lorraine-Deitrich sharing this distinction. French makes — Chenard-Walcker, Lorraine-Deitrich, Bugatti, Delahaye — collectively copped six victories, which was the same as the joint Bentley *cum* Lagonda take.

If it's stomach knotting drama you're looking for, moreover, the Alfa *vs.* Alfa finish in 1933 outmatches anything the Bentley saga yields. By comparison with this, the Ferrari-Jaguar beatup in 1954, in which the former won by a margin equal to 9.5 feet in every mile covered, pales to a pushover.

Protagonists in this Alfa dogfight were Nuvolari paired with Sommer, Chinetti with Varent. Nuvolari and Chinetti handled the closing shifts. With just enough time left for one more lap, Chinetti passed Nuvolari on the start-finish line—and they were quits on distance. Then, in the Esses, Nuvolari repassed. For the rest of the lap the two cars were mostly little more than a slipstream apart, the little Mantuan monkey crossing the line with a lead that calculation translated into 0.249 miles. Over the total distance of 1953 miles, this represented a discrepancy of 8.076 *inches* per mile.

The winning Alfa, incidentally, had narrowly missed enforced retirement in circumstances with the makings of a sermon on the evils of alcohol. Hours before the finish its gas tank sprang a leak, and the Nuvolari-Sommer mechanic was entrusted with the job of caulking the split with chewing gum each time the car pitted. But his buddies, counting victory chickens before they were hatched, kept plying this artisan with champagne, with the result he stuck repeated gobs of gum on intact portions of the tank, leaving the hole to gush unhindered.

Sommer, who co-drove winning Alfas twice in a row — 1932 and '33 — was the top Le Mans idol of his day, adored by an unofficial fan club that was probably numbered in millions. Disdainful of prudence in his handling of a car, he always drove as though this were the *Vingt-Quartre Minutes* rather than *Heures*. Addicted to horsing and sartorial eccentricity, (he raced one time in a straw boater, secure under his current Alfa's hardtop), Sommer, like Mike Hawthorn, never really left his boyhood behind. Because he liked the customers to get value for their money he'd stagemanage his passing manoeuvers to take place right in front of the pits' grandstand, maybe twenty or more times in a single Le Mans race. He probably set more fastest laps than any other driver, though many of these marks were beaten again before the Sunday's 4 o'clock chime; but two of them weren't, including the first over-ninety lap in the series (1933,

90.96 mph), and his 96.177 in '38. It was during his last Le Mans, in 1950, that the Briggs Cunningham stable came equipped with mobile radio for two-way communication between pit and drivers. Sommer's answer to this was to scribble messages on bits of paper while making 130 mph in his Ferrari and toss them out of the window; cheaper than radio, and no comebacks either.

Sommer's crackups at Le Mans, which certainly outnumbered his finishes, usually happened fairly early in the proceedings; but there was an exception in 1938 when he and Clemente Biondetti, the multiple Mille Miglia winner, led for twenty-one hours out of twenty-four. Sommer personally did most of the hustling for this Alfa partnership, preserving his usual laughing *sang froid* following a tire burst at 140 mph on the Mulsanne Straight. When the Alfa's engine finally developed crippling stitches, the car had established a mileage that the ultimate winners, Chaboud and Tremoulet, took two hours to catch up.

In the infancy of Le Mans, when many drivers seemed to share the *Motor's* view that the event was a trial rather than a race, and bated their throttle toes accordingly, the standard of basic mechanical reliability was at a level commensurate with these softly-softly tactics. The first year of all, for instance, there were thirty-five starters and not one of them made a pit-stop in the first three hours. Lighting systems were the Achilles Heel back then, despite the fact that most crews took the precaution of carrying both electric and acetylene equipment. With the coming of nightfall in the 1923 opener, one third of the entry was in some sort of candlepower trouble.

To make visibility worse still under the conditions resulting from partial or complete defection of the chandlery, there wasn't a windscreen wiper on a single competing car; in rain, and there was plenty, this proved such an embarassment that the S.A.R.A. team drivers grabbed wrenches and knocked the glass out of their screens.

Although the pavement was atrocious by present day Le Mans standards, Duff and Clement, Britain's sole representatives, voluntarily dispensed with a spare wheel on their 3-litre Bentley. Their tires, of a long forgotten English make called Rapson, justified this extraordinary faith. The Bentley, which placed fourth and set the fastest lap at 66.69 mph, comfortably lasted the race out on one set of boots.

It would perhaps be truer to say the Bentley and a French soldier's pedal bike jointly won fourth place. When Duff punctured his fuel tank at one stage, and the news of his predicament was phoned in to the pits, the A.C.O. assembled a jury to deliberate whether Clement should be allowed to bicycle the three miles to the stranded car with gas replenishments. Yes, the debaters resolved, he should, and he did. Not having a bike of his own on hand he hijacked the first one his eye lighted on, which happened to belong to a corporal of *Chassseurs*. He was, as a footnote to Le Mans history records, a worried man on discovering his loss.

(Continued on page 88)

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Le Mans Melange

(Continued from page 87)

The following year, little knowing what they'd have to answer for as the founders of the Great Green Cars tradition and all the bumbledom it has begotten, Duff and Clement made no mistake and won outright, without aid from bicycles. By this time the essentially racing character of the contest had become apparent to all, with the result nearly everyone went like crazy from the word go and "the roadside was literally strewn with wrecked machines", as one report put it. Out of 41 starters only fourteen survived. Stock tactics from now on were to stick your foot through the bulkhead and just hope nothing would fracture this side of Sunday teatime.

With a few exceptions the same methods were used on a gradually intensifying scale right down the line, hitting a new peak with the introduction in 1939 of a system of hourly bonus prizes for the leader on distance. Principal beneficiary from these disbursements in '39 was the fiery Louis Gerard (Delage), who, when his team manager asked him what he proposed using for strategy, had the candour to say he was in business strictly for bonuses. He won sixteen of the twenty-four purses and, with Georges Monneret as co-driver, was leading by five laps after twenty-one hours. Then, inevitably, something went ping inside.

Backtracking briefly to earlier days, it wasn't only on the circuit but in pitwork too that the concept of Le Mans as a hairy sprint was in evidence. True, haste wasn't necessarily synonymous with speed, though it was often good for some laughs. Typical of the amateur comedians fostered in this climate was a fellow called Collomb, who once verified his suspicion of ignition trouble on his Corre La Licorne by grabbing each spark plug terminal in sequence while the engine was turning at a fast idle at its pit. At each contact he shot a foot into the air. The Corre La Licorne had six cylinders, so that made six vertical takeoffs for the hardy Collomb.

Mostly the zanier cars and drivers of yesteryear at Le Mans were French, exemplified by an enthusiast who was so impatient to get on with the dering-do he forgot to put any fuel in his B.N.C.'s tank before the lineup. As the rest of the field departed he hurriedly rectified the drought, but he was only fated to break one record, viz., for the shortest distance ever traveled in twenty-four hours at Le Mans or elsewhere: zero millimeters. Even with benefit of gas, the B.N.C. wouldn't go.

At Le Mans it's legendary that *"les choses sont contre nous"*. Sometimes *les choses* win, sometimes *nous*. Redlettered—among many others — for their doughty fights against adversity are Robert Sénéchal and J. A. Gregoire. In 1925, paired with Loqueheux, Sénéchal was shooting for the first Triennial Cup. At a switch of drivers at two in the morning, Loqueheux absentmindedly omitted to give Sénéchal a weather report; so the latter, unprepared for local fog, went straight on where the course corkscrewed at Arnage, jumping a ditch and planting his Chenard-Walcker atop a considerable bank. All he needed to get it back into play was a bridge. Well, Sénéchal *made* his bridge. For material, he singlehandedly cut down a hundred and fifty feet of wood fencing. The operation cost him about an hour and four pounds in weight, but he and Loqueheux nonetheless won the coveted Triennial Cup.

Gregoire, designer-builder-driver of the front-drive Tracta, suffered *his* slip 'twixt cup and lip' in the 1930 race. As the last few minutes of *Les Vingt-Quatre Heures* were running out, he skidded on a wet turn and bored his Tracta's nose into a sandbank, with only its undriven back wheels left on traction-giving pavement. The marshal on the spot, as well aware as Gregoire that aid from him would involve the car's disqualification, shrugged and turned away. It was then that Gregoire noticed a couple of heavensent *choses* (yes, benevolent ones this time) lying inconspicuously in the Tracta's shadow: a shovel and a baulk of timber. Heaving sand like a hundred-horsepower dredger, he exhumed the little blue buggy in moments, drove on to bisect the finish line at the very instant the checkered flag was fluttering out.

—Dennis May

DAF

(Continued from page 27)

Performance of the DAF, with its unique transmission, is interesting. Compared with other cars of the same capacity, like the Fiat 600, the DAF's acceleration from a stand still is a trifle slower because the centrifugal clutch does not engage instantly. The DAF's overall acceleration, however, is better in most cases because there are no embarrassing pauses while gears are being swapped. No matter how expert you may be with a gear box it is pretty difficult to beat a continuous, uninterrupted change-up in ratio that is automatically governed by engine speed and torque.

Apart from a certain amount of mechanical noise, like ticking valves, the little engine can be considered a quiet power plant. During acceleration, the exhaust note is crisp, but not unpleasant, and almost disappears once a steady cruising speed is attained. The only sound in our test car which did not disappear was a soft whine emanating from the reduction gears in both rear axles. At first it wasn't too noticeable, but after a few hundred miles it began to take on the pain-producing qualities of a buzzing dentist's drill. When we questioned the DAF engineers about it, they assured us that noisy cogs will be a thing of the past once all gear cutting and gear mating machinery is properly set up.

From inside, the DAF gives the impression of being a much bigger car. It is very roomy, having more interior space than a VW. In fact, its inside measurements are about the same as the new Farina-designed Austin A-40. Driving the DAF is simplicity itself. It is just like piloting a big Detroiter with fully automatic transmission without having to accept any of the big car's disadvantages of weight and size. With a turning circle of 28 feet, achieved with only

two-and-half turns lock to lock, the DAF can be whipped through traffic like a tricycle. Parking is just as simple with both front and rear fenders in easy view from the driver's seat. An additional plus feature of the Variomatic during close maneuvering is that, unlike fluid-filled torque converters, it will not creep.

On take off—once the centrifugal clutch takes up — the variomatic continually "changes up" to the highest usable transmission ratio. When the road starts to climb — or wheel resistance increases for any reason — the belts automatically select a lower ratio which adjusts the road speed to the available power at different throttle openings. The heart of the system –the movement in and out of the pulley halves — works directly off the vacuum of the intake manifold. One part of the control mechanism assists the centrifugal weights that force the two halves of the front pulleys together as the speed of the car increases. This vacuum assist depends on throttle opening and driving resistance –both influence manifold pressure—which is important to the sensitivity of the Variomatic system.

When the throttle is completely closed a valve shuts off the vacuum assist, which prevents the transmission from selecting, automatically, the highest possible ratio. In stop and go driving, this cut out allows the DAF to come almost to a complete halt while the transmission remains in a suitable ratio for quick acceleration. A second vacuum device permits engine braking for mountain driving. This system can be locked in or out of operation by use of a small knob on the dashboard. It works exactly like the first system — except in reverse. Its job is to keep the transmission in the lowest possible ratio. Still a third vacuum system goes into operation when the pressure in the hydraulic brake system exceeds 220 lbs. per sq. in. Thus when braking hard the Variomatic "changes-down" to lower ratio, thus giving the best pulley diameter for fast acceleration after a sudden stop.

A description of all the little ins and outs of the automatic transmission makes it sound a lot more complicated and fragile than it really is. It is impossible to make the V-belts slip once they are properly adjusted. This has to be done after the first 1000 miles, as the belts are a little rough when new. This is done by turning a nut situated alongside the exhaust pipe at the rear of the car until the warning light on the dashboard — indicating that both halves of the rear pulleys are not far enough apart when the car is standing still — goes out.

During the test we tried everything we could think of to break up the Variomatic – or to get the belts to slip. We repeatedly stopped and re-started on a steep hill, drove the car up to its axles in water and mud, all without seeming to phase the Variomatic. After driving the car it is my personal opinion that the system is fool proof — and possibly idiot proof.

The little DAF has very good roadholding characteristics in conjunction with a pleasant ride. Because of the fore and aft weight distribution — the engine way up in the bow and the transmission under

(Continued on page 95)

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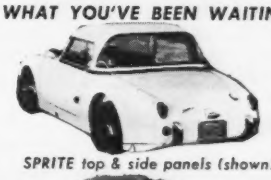

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Triumph

(Continued from page 31)

The flywheel was then bolted on and the procedure repeated. It was found that the flywheel needed no change, so the clutch assembly was added next. Another small hole drilled in the clutch was enough to balance that unit and the job was finished.

While the balancing job was being done, the head came in for a bit of attention. A light cut was made to ensure a perfectly flat surface. This is a very important step because a slight warp or pits could cause leakage and blown head gaskets. The combustion chambers were cleaned up to eliminate any hot spots that might cause detonation and/or running on.

It was found that the ports matched almost perfectly with their respective manifolds so very little work was required there other than a slight amount of cleaning up.

The intake valves and new exhaust valves were lapped into place and the new valve springs checked for equal strength. After this the assemblies were installed and the head was set aside.

Reassembly was started with the installation of the crank in the block. Once again the factory shop manual was open for reference and all torque readings adhered to. After the main bearing caps were cinched down the block was turned right-side-up and the cylinder sleeves put in. This is a simple operation but if done without care could lead to coolant leakage problems later. The sleeves sit on soft metal gaskets, shaped like figure-eights, one per each pair of sleeves, and once in place must remain locked in position while the pistons are put in. If this is not done the sleeves may move and break the seal at the bottom with a resultant leak of coolant into the sump *after* the engine is completely assembled and put back in the car. And you needn't be told what a heartache that would be! The manual shows a special retaining device that slips over a head stud and bears down on the sleeve to keep it tight. A large socket does the job just as well and was used in this case, two being needed to hold the four sleeves.

The pistons were fitted with new rings and dropped into the cylinders. Wall clearance was held to stock specs in this case since the car is to be used on the road as well as in competition. Additional clearance would be advisable if the machine is to be used strictly for racing. The bearing caps are then bolted on and torqued down according to factory specs.

Next to be attached are the flywheel and camshaft. Although this must all be carefully done, no deviation from recommended factor procedures occurred and the entire operation is outlined in the shop manual. It is only after the flywheel, camshaft, chain, tensioner, front cover plate and pulley have been installed that the little extra care that makes for top performance comes in. A dial indicator was set on the front piston and positioned to indicate *exact* top dead center. As can be seen in the accompanying photograph the factory mark (a hole in the front pulley) was almost five degrees late when the crank was at TDC. A new mark was filed in the pulley to line up with the indicator on the cover. This mark will be used for all future timing operations. A degree wheel was next bolted to the flywheel and a wire indicator set at zero while the #1 and #4 pistons remained at TDC. The dial indicator was then removed from the top of the block and the tappets lubricated and dropped into the tappet chambers. Next, the head was attached and torqued down properly. The rocker shaft assembly was the next to go on, after which the dial indicator came into play again. Set atop the head with the plunger resting on the end of a valve stem, as the flywheel was turned, the indicator was watched until the cam was in the exact spot for proper valve clearance measurements. This is most easily explained as follows:

The crank is rocked until the dial indicator reaches its lowest point of indication, at which point the lifter is resting on the foot of the ramp. Continuing to rotate the crank will indicate a sharp lift of the valve, while rotation in the other direction will show a very slight lift as the heel of the cam comes in contact with the lifter. The spot between these two lifts is the proper place for valve clearance measurements on the Triumph engine.

The valve being checked is then set to .015 inch clearance with a feeler gauge. This is for valve timing purposes and is not the correct clearance for running the engine. Then the crank is rotated through 360 degrees and the indicator watched to check both timing and amount of lift. It was found on this particular engine that the cam needed no adjustment as timing was perfect according to factory specs on all valves. When the crank was rotated in a clockwise direction when viewed from the front end, the intake valve on number four cylinder opened at 15 degrees before TDC and closed at 55 degrees after BDC. The exhaust opened 55 degrees before BDC and closed 15 degrees after TDC. The other cylinders checked out as well.

After the timing operation was completed the reassembly procedure was continued following instructions and recommended torque readings. The engine was then hoisted as in the removal operation, positioned over the car, and lowered into place. Installation is then completed in a standard manner and the body panels refitted.

Now that the engine work was finished the rest of the factory-option competition equipment was installed. It was decided not to use the aluminum sump since it is a rather fragile item for knocking around in the street and does not help that much in short races. The Alfin drums *were* used however, due in part to the fact that one of the stock drums was slightly out of round and because they do help to dissipate heat. As mentioned before, competition shocks and springs were already on the car so they were merely checked.

One item that would be very desirable, and would add greatly to the stability, and therefore safety, of the Triumph, is an anti-roll bar for the front end. It would help to prevent rear wheel lift during cornering by minimizing the tendency of the front end to dive and lean. Unfortunately it is not a factory option and is therefore illegal according to the rules

governing S.C.C.A. production car racing. We would suggest that an anti-roll bar be used for both normal street use and for high speed touring, and would like to see it allowed in racing. A bar made especially for the Triumph is distributed by The Armel Company, 130 Shore Road, Port Washington, N. Y.

To complete the job a roll bar, fire extinguisher and seat belt need be installed. There are as many different roll bar installations as there are cars, so the choice is yours just as long as it meets minimum strength requirements.

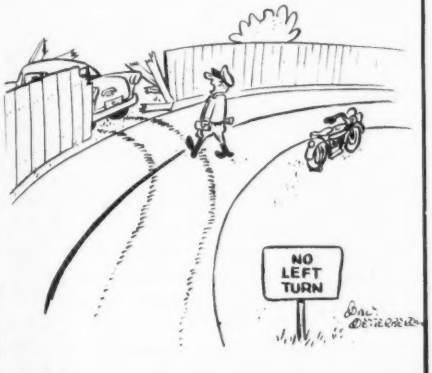
To summarize, the important things to consider and *do* to prepare a car for competition are:

■

1. INSPECTION. There's no point in building your racing engine around faulty parts.
2. BALANCE. There is no sense in setting an engine up right for peak performance if it is going to shake itself apart at sustained high revs.
3. VALVE TIMING. If the engine can't breathe properly, it won't run properly either. The factory's timing marks can be out due to production tolerances. This is acceptable for general run-of-the-mill driving but not for racing.
4. COMBUSTION CHAMBERS. These must be smooth and free of hot spots. The spark plugs, and not little glowing pieces of cylinder heads, are supposed to ignite the fuel.
5. FOLLOW INSTRUCTIONS. The factory Service Instruction Manual outlines in detail all procedures for dismantling and reassembly of your car. Aside from certain hints and suggestions for competition preparation, which are included in this article, the manual was followed to the letter.

■

We would be glad to answer any questions you might have concerning this article, and Ed Brown has told us that anyone who is genuinely interested in watching preparation of this sort being performed is welcome to his shop. The address is 72 Belmont Avenue, Belleville, N. J. Bring your own popcorn.



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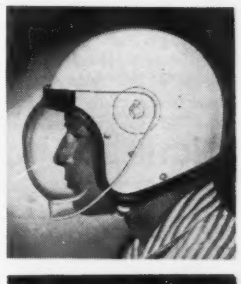

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4 For

(Continued from page 43)

of the vehicle. Thompson approached tire companies. They yawned in his face and ignored his correspondence. One firm (that also looked on Frank Lockhart with heavy-lidded silence) later made the excuse, "We thought you were joking." Then Thompson recalled having met Goodyear's research and development chief back in the Panam days. He phoned Ohio and a week later the company flew research engineers to California to consult with Thompson. Certainly they could build the required tires; the problems were essentially the same as those involved in building tires for the landing gear of jet aircraft. Goodyear would even design and build special wheels for the special tires. This decision was made about Nov. 1 and freed Thompson to go ahead with chassis design and construction.

First, the choice of engines. He wanted to have at least 2000 hp available to push a smaller car than Cobb's at higher speed. And the car, of course, should be as small as possible, above all in terms of frontal area. Four big-bore Chryslers could deliver the power. Two of these mounted side by side would dictate a body width of more than seven feet. Big Pontiacs, however, could be mounted in the same way and could be contained in an envelope only four-feet, 11-inches wide. Width of the Cobb machine was eight feet.

One problem in the use of four engines placed side by side in tandem is that the immense amount of torque produced could create a problem in stability. In consequence two of the engines are built to run in the normal direction of rotation and are placed end to end on one side. The other pair run in the opposite direction. This, of course necessitated new timing for those plants. These cams and the cams for the other two as well were designed and ground by Harman & Collins. Total power developed by this combination is expected to come to a shade over 2000 bhp.

Next, how to transmit the power to the wheels. The front pair of engines was mounted with flywheels facing the front axle; the rear pair with its flywheels facing the rear axle. Cadillac transmissions were mounted on each of the four engines, feeding into four final drive units, one for each wheel.

Thompson calculated that, with the tires Goodyear was making for him, a final drive ratio of 1.30 to one (same as Cobb's) would be required to reach a speed of 435 mph. This, however, implied gear speeds and bearing loads that would be impossibly high, so Thompson with quick, sure originality designed and fabricated overdrive units for each of the four wheels.

These overdrives resemble nothing so much as quick-change rear end units and operate in a very similar manner. The clever design of these drives now has the added advantage of allowing fairly rapid changes in gearing as well as serving the intended purpose of reducing pinion speeds to a reasonable figure from the impossible 20,000 rpm that would result without them.

The tires developed by Goodyear for the car are low-profile covers of approximately six inches in width by some four-and-a-fraction inches in vertical section. The special alloy wheels on which they fit have been subjected to destruction tests and as this is being written have withstood every test—i.e., so far the tests have failed to produce the intended destruction.

On Jan. 1, Thompson had completed the construction of a jig in which to assemble the chassis. Five days later the complex axles were in place. By Jan. 15 the four engines and transmissions were installed and by the first week in February the steel-tube frame was complete. Thompson had set himself a deadline for completion of the entire car by July 15. At the rate he's going he'll have time to burn.

George Hill, author of the critical aspects of the 294-mph experimental car's body design, naturally is in charge of creating the body for the LSR machine. Thompson, however, dictated that the front wheels must be left open at the sides, that the driver must sit aft of the rear axle and that there be *no* flat, horizontal surfaces at the rear of the machine. The shell that Hill has designed is 59 ins. wide at the front wheels and 53 at the rear. Ground clearance is five ins., greatest thickness of the body is 24 ins., greatest height is 39 ins.—at the top of the canopy. Aside from this projection, greatest body height is 30 ins.

The car's tail extends 84 ins. beyond the rear axle and at present is deliberately designed not to function as a factor influencing lateral stability; that of the tailless experimental car left nothing to be desired. But the new tail can of course be altered in length if test runs prove this to be desirable.

The finned tail shown here is slightly different from the originally planned shape but the prime purpose of the fin is not lateral stability but rather a method of utilizing and directing downward flowing air pressure. The basic curvature of the body if carried out to a point would make a tail area that was impossibly long. Yet merely to increse the curvature to form a point or otherwise change the shape would create hazardous turbulence problems and possible tail lift. Hill, therefore, decided to slice the excess tail off but still retain the curve as if it were going to continue on back to the theoretically ideal spot. To comply with Thompson's request that there be no flat surface at the rear the wind-splitting semi-fin was added.

The frontal area of the slick Hill-designed body is a mere 13.78 sq. ft., far smaller than that of Cobb's machine. By nitrating his fuel, Thompson will have access to about the same horsepower that propelled the Cobb car. The aerodynamics of the new LSR challenger have been proved sound. There is no question as to Thompson's ability as a builder and a driver of very fast machinery. So, when he is pushed off at Bonneville next Aug. 23, we certainly may see a new Land Speed Record won by an American, with American iron, nitro and know-how.

They Said . . .

(Continued from page 60)

nearly as tired as we had expected but were ready for the sack. The Motel we chose at random turned out to be in the middle of an old Civil War fort. A sign proclaims that the last battle of the conflict was fought behind these breastworks. "Look, Charlie," I pointed to the placque, "tonight you are going to sleep on hallowed ground." "Fine," he said, "but tomorrow night let's get a bed."

The only tuning change we had made in either car (and the only attention they really had except an oil change and a lube job) was in changing the stock sparkplugs from the racing type used in the enduro. Even this might not have been done if the engines had fired up easily when cold, but we were happy for the switch when the morning in Mobile turned out to be quite cool. Then we proceeded along the Gulf at a restricted pace and we were doubly happy because a constant traffic congestion caused us to run at a reduced speed guaranteed to foul electrodes. Revving up the engines to clear them out was inclined to create excessive noise and to draw the attention of passing police, so we putted through a dozen towns and villages.

Gendarmes were drawn to our diminutive caravan anyway because of the big Sebring numbers still on the hood, sides and back plus the British license plates. In one city a cycle patrolman drew up alongside and engaged Charlie in conversation for ten blocks in "rush hour" traffic (15 mph). It seems he used to own a TD and was eager to become a Sprite owner. Another officer kept pace with me for a while, asked about the race and invited us to a Drive In for a cup of coffee.

Making a trip in a race car is somewhat like making a trip in a sports car was ten years ago only more so. Wherever we stopped, a crowd of enthusiasts and curious gathered. We rehashed the race, discussed the technical points of the cars and heard about the local hotshoes. At one Louisiana filling station the usual group congregated to ask more or less informed questions. In this particular section the trend was to the less informed so when one lanky Cajun asked, "By Gar, heem go pretty good, hey?" Charlie replied, "Yes, in its class. You see, these cars race against other cars of the same general type. They are separated by the size of the engines and compete with each other, and not with the bigger ones."

"Oui," nodded the native pointing to the Sprite, "you run heem in class 4 GT or under appendix C?"

The lack of a fan on the Sprite was no handicap on the road where the gauge remained at a constant 180 but in slow moving traffic or when trapped behind big busses, the needle would swing over alarmingly. In midday we were forced to halt once to cool the radiator with a stream of water from an amiable service station operator's hose. Oil pressure stayed healthy, however, so we pushed on and detoured around the centers of large cities when possible.

(Continued on page 94)

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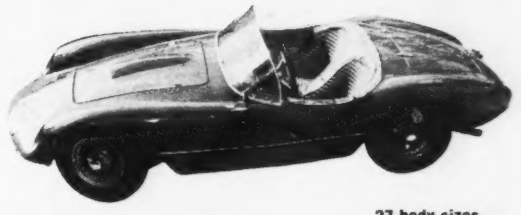

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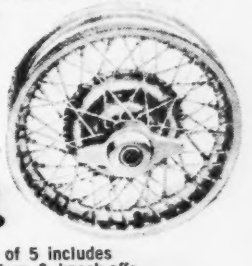

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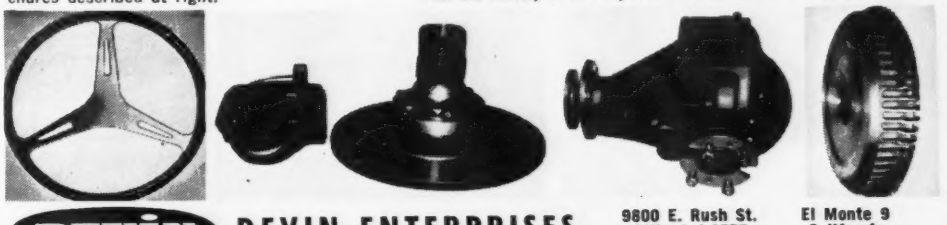

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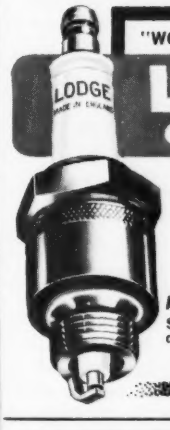

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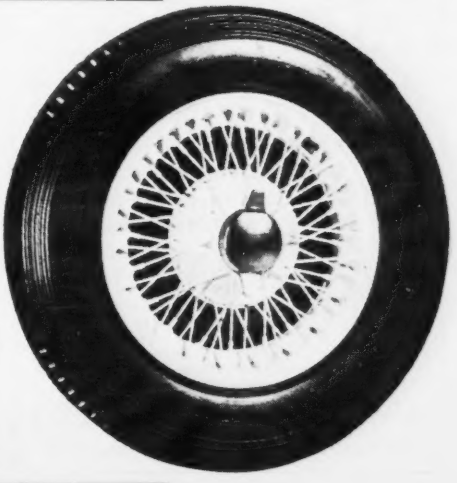

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They Said . . .

(Continued from page 93)

Up to this point we had treated the cars in an extremely conservative fashion. First of all because, even though outward appearance may indicate that all is well, a little more abuse such as incurred in the 12-hour thing could push some part over the brink of failure. Secondly, the general air of skepticism that we could make the Coast in the unaltered racers without trouble had its negative effect on our thinking. However, by the time we had put 1,200 miles on the odometers without incident we were a couple of tigers once more. Charlie was absolutely raving about the Sprite when we would stop for chow; the tremendous ease of stopping with the disc brakes ("you don't push harder on the pedal, you just push a little farther") its ability to stick like glue on the turns (and he's an old Lancia driver, you know) and the little engine's fantastic surge of power above 4,500 rpm. My own impression of the A was that this is a superb Gran Turismo car: Plenty of power where you want it for a road car, coming on strong at 3,500 (about 65 with these gears) seemingly unlimited top-end revs and generous driving comfort. The new (to me, at least) Dunlop R-5 tires seemed a great improvement over the R-3 type which were on the Twin Cam I drove on the Coast and corrected the one fault I had noticed in racing at Pomona—the tendency to spin the rear wheels when you stand on it coming out of a corner. The R-5's just don't want to break loose under the same conditions.

So, with renewed confidence, engendered by the fact that nothing had blown up so far, and a chance to wring out a couple of factory-prepared and demonstrably successful pieces, I suggested we get up early and try to pick up a little time on the semi-deserted roads of East Texas. Nothing loath, Charlie set the alarm for 3 AM and we sallied into the stillness. Whatever happened to the farmers that used to get up so early, John? We didn't see another moving vehicle for nearly three hours. In that time we had established that it would take a very good car indeed to stay up with these two on anything but a long, straight highway, or, possibly a near-vertical uphill bit. In this section of the country the road wanders over rolling hills — some fairly steep, through timbered country and farmland where the road builders followed rather devious methods to get around Smith's barn. It all added up to exhilarating driving—sudden, unexpected bends, reverse camber turns, 4 or 5 mile unobstructed straights—real fun.

The A's quick steering and the rear end's absolute refusal to come loose made it like driving the cliché car "on rails" . . . until the rain began to fall. Then we had it! With the same tire pressure that the car had finished the race — 28 lbs. — the glorious R5's were slicker than a greased doorknob. In the dry, the Twin Cam had been as tractable as a pet collie, now it was like trying to drive a boar hog across a frozen pond. I don't know what pressure you people used during the rain at Sebring, but I did know that Richie Ginther was down to 7 lbs. all around in the Ferrari so, here was a decision: To valve or not to valve some gas? Unfortunately neither car had a tire gage in the tool kit and to release pressure by guess is a little risky. Then, too, this was nitrogen . . . and inert gas in the tires would be a real boon when we hit the desert later on. After some mental gymnastics around the gas laws, coefficients of expansion, time lost in refilling the tires once we found an open service station and so on, I made an arbitrary decision to save the nitrogen . . . and ease off a bit.

To give you an idea of how slick it was, I nearly looped out while leaving a stop sign in a small town when I hit second gear. In spite of such conditions, we drove for 254 miles before stopping for breakfast at an average speed of just over 64 mph! At no time did I rev the Twin Cam over 5,200 . . . at least when the tach was working.

Out through here you see the wonderful roadside signs such as "Illegal To Track Mud Onto Pavement" and the various warnings of the fines levied for depositing litter on the right of way. This varied from $100 to $50 then when we hit one place that had only a $25 fine, Charlie suggested we throw out our beer cans because this was as cheap as it would ever get. Here too, is where the hotrodders are taking up sporty cars and they are building their own out of old Hadacol signs. You'd better watch out around New Orleans, too, a couple of fellows there are disguising a Chrysler dragster with a TD body.

Fierce!

The fuel pump which I had revised in Florida needed adjustment in Ozona, Texas, and Charlie pointed out the Sprite's selling points to a couple of Indians who lounged against their Coupe deVille while I sprawled under the jacked-up rear end, fuel trickling down into my armpit, and reset the point clearance.

"How do you like those disc brakes?" Charlie asked.

"Ugh," answered the Indian in traditional fashion.

"Engine has the latest mods. Turn 8,000 . . . over 100 in top gear."

"Ugh. Where-um one for other foot? Hah!"

The rough detours we encountered later in the day were a test of suspension we hadn't counted on. Big holes in the torn up paving or dirt road would practically lose the Sprite's 13" wheels and the pounding completely conked out its tachometer. My seat belt didn't work at all and the sensation was somewhat akin to being inside a churn. In spite of this treatment, the only damage was to the tach. At one point huge signs warned "DANGER. BLASTING, Turn off All Radios". We later surmised that this was so you'd be sure to hear the blasts and enjoy sounds that have not as yet been marketed on HiFi discs.

Despite various unfavorable road conditions we made 863 miles before knocking off and completely sold ourselves that these two cars would run to the moon if somebody would build the necessary bridge. We switched the Sprite's spare to the left front simply to equalize the rub-

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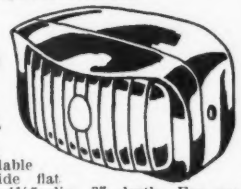

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ber on the two steerable wheels and barged on to Los Angeles. The airscoop on the hood of the Twin Cam that admits breezes to the driver's feet came in handy crossing the wastes between Phoenix and Riverside and this looks like a modification that might catch on with the racing fraternity. Otherwise, there is no change I can suggest to BMC that would in any way make the MGA coupe a more desirable commodity.

At the end of our trip we had covered exactly 3,000 miles, incurred no measurable wear on the tires of either car, averaged above 50 mph for daytime driving time (including all stops) and got 43 mpg on the Sprite, 32 mpg on the Twin Cam.

That's about it, John. As far as we are concerned, anyone else can take the bus. Leave the race cars to us.

Best Regards,
OCee

DAF

(Continued from page 88)

the rear seat — the car exhibits nearly neutral steering. When cornering fast, however, the movement of the body causes not only a change in camber, but a certain amount of toe out of the rear wheels. This is caused by the pivot line of the locating triangles on the swinging rear axles, which are not parallel to the center line of the car. Thus when driven really fast down curving mountain roads, the DAF shows traces of oversteer, which means that the rear end of the car has a tendency to swing out on corners.

As far as the all-around road holding goes, the car could easily cope with a little more power and a higher top speed. Even when running down hill at speeds of around 70 to 75 mph, the DAF felt rock steady. In line with this the DAF engineers told us that they are now working on a somewhat bigger engine developing about 25 to 26 hp. We think that this modification would better adapt the DAF to American traffic conditions. Even with the 22 hp mill we had no trouble in keeping up with the fast moving traffic flow in Paris, and even beating quite a few "deux Cheveaux" at numerous Stoplight Grand Prix.

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(Continued on page 97)

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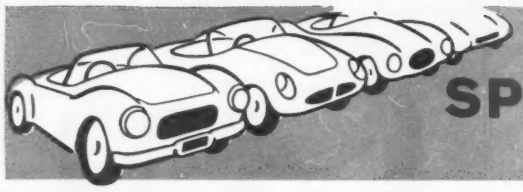

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DAF

(Continued from page 95)

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Two-way average ..... 53 mph

ACCELERATION:

from zero to	seconds
30 mph	10.5
40 mph	17.0
50 mph	28.5
Standing ¼ mile	28.3
Speed at end of quarter	49 mph

SPEEDOMETER CORRECTION:

Speedometer was calibrated in kilometers. Error varied from 0 to 10%.

FUEL CONSUMPTION:

Hard driving ..... 31 mpg
Average driving (Under 60 mph) .... 37 mpg

SPECIFICATIONS

POWER UNIT:

Type	Air-cooled, opposed twin
Valve Operation	pushrod overhead
Bore & Stroke	3 x 2½ in (76 x 65 mm)
Stroke Bore Ratio	0.83 : 1
Displacement	35.4 cu in (580cc)
Compression Ratio	7.1 : 1
Carburetion by	downdraft carburetor
Max. Power	22 bhp @ 4000 rpm (SAE)
Max. Torque	32.5 lbs-ft @ 2500 rpm (SAE)
Idle Speed	between 600-800 rpm

DRIVE TRAIN:

Transmission ratios vary continuously from 20 : 1 to 4.4 : 1 overall.
Axle torque taken by control arms.

CHASSIS

Unit body-frame construction of pressed steel.

Wheelbase	81 in
Tread, front and rear	48½ in
Front Suspension	transverse leaf spring with hydraulic telescopic shock absorbers, which also function as swivels
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Shock absorbers	hydraulic tubular
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Steering wheel turns L. to L.	2½
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GENERAL

Length	142 in
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Weight (factory figure)	1390 lbs
Weight, as tested (one person)	1540 lbs
Weight distribution, F R as tested	50 50
Fuel capacity	7.5 U.S. Gallons

RATING FACTORS:

Specific Power Output	0.6 bhp cu in—37.4 pk ltr
Power to Weight Ratio (one up)	70 lbs hp
Piston speed @ 4000 rpm	1685 ft min
Braking Area (one up)	86 sq in ton
Speed @ 1000 rpm in top gear	14.1 mph

Stingray

(Continued from page 57)

Where the original car had trouble, and where it was most painfully obvious in the Stingray, was in the brake department. The car has a rather weird braking system incorporating a servo assist and a front/rear proportioning device. In theory it works real fine but the big problem at Marlboro was the fact that Dick Thompson just didn't have enough time to get used to the thing. The twisty circuit didn't help much either. To support this we might quote Thompson after the qualifying run . . . "It's great . . . and a little more than I can handle right now. The brakes are new and a bit uneven. We'll have plenty to do in the next ten days." (The next outing would be at Danville on May 2nd.) One of the mechanics was heard to say, "It's fine dry, but if it rains tomorrow for the race, we'll finish last."

And sure enough, race day dawned dark and cloudy with rain starting during the first event. In the pit, Stingray bore signs of change; new brake fluid had been put in, a metal airscoop had been tacked on behind the cockpit and the twin set of hood louvers had been completely cut out. All these modifications seemed to indicate an attempt to improve braking.

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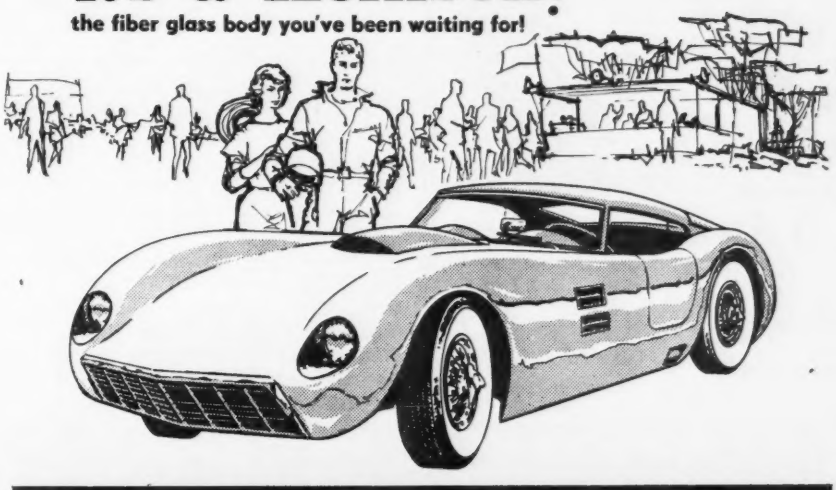

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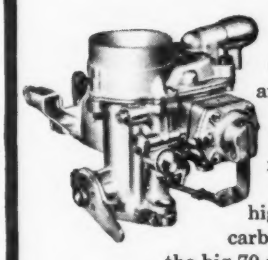

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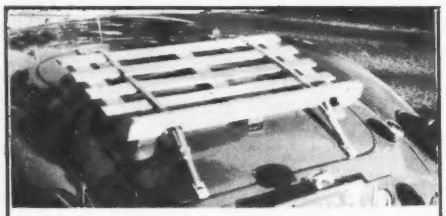
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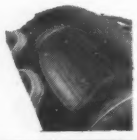
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Stingray

(Continued from page 97)

Continuous light showers made the track even more treacherous and almost every lap saw a spinout, most frequently at Cappy's Corner . . . a tight loop that gives trouble to small production cars, not to mention the big C Modified machines. By the time the feature event was to be run the stretch leading into the corner had sent many a production Corvette fishtailing while braking for the turn.

On the grid the Stingray lined up for its first race beside an RSK Porsche, a Lister Corvette and a Lister Jag. With only fifteen minutes logged in this machine, Thompson faced not only tough and tested opposition, but a slick and twisting track ill-suited for a car with the Stingray's handling characteristics. Once off the grid, the car stayed with the other front line starters but seemed to have trouble controlling wheelspin.

The Stingray made its best showing on the ¾ mile back straight where it flew past the now lapped stragglers. It was harder for Thompson to get through the corners which were now twice as difficult with traffic. At midrace Cappy's Corner claimed the Stingray as Thompson spun out and lost a half lap to the leaders. Returning to the track Dick had his hands full trying to catch up, trying various front/rear brake combinations in an effort to make up time. During the last quarter of the race he became aware of overheating problems and began to stroke it in order to prevent possible damage and to get better acquainted with the brakes. When the rear ones got troublesome he shut them off for four laps then switched on again to find that the brief rest had perked them up. Even with all the trouble in the corners the Stingray gobbled up the straight stretches to finish fourth behind two RSKs and the Lister Jag.

Obviously pleased by the results, Mitchell stated that, "The Stingray is no longer a show car. Now we're ready to race," but he refused to comment on future plans or possible European races.

Judging from its brief but promising performance there's going to be a lot of action when some of the handling difficulties are worked out, and it's quite logical to assume that the Stingray will be whetting its barbed tail with a diet of dung-beetles in mind.

—du

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July 1959

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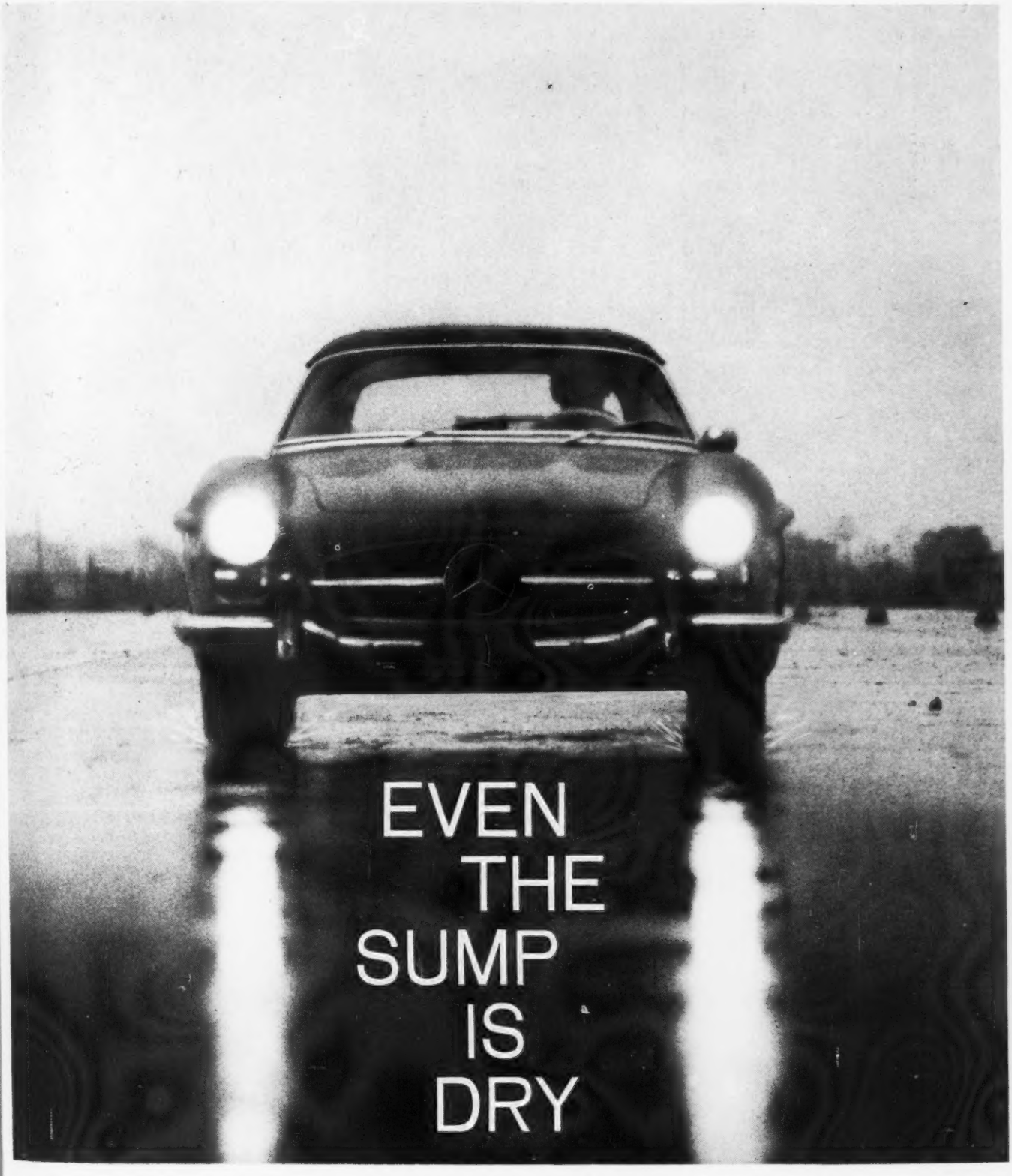

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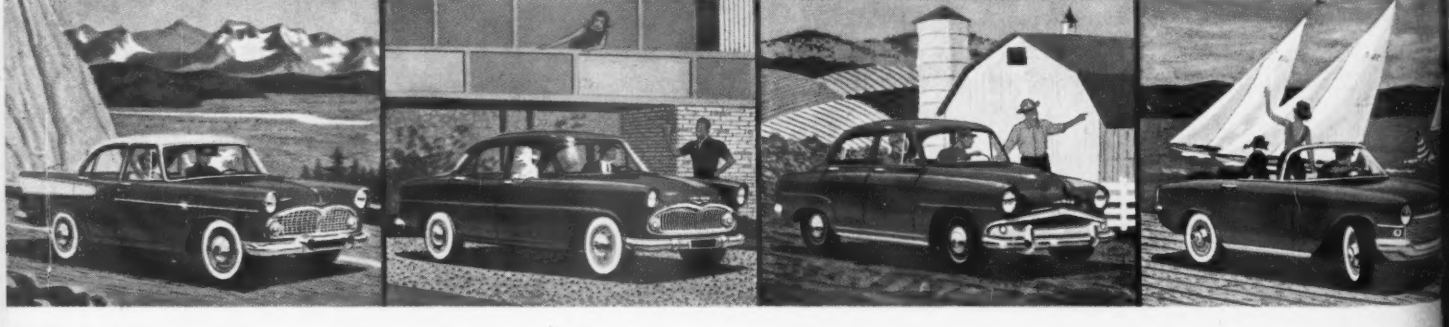

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